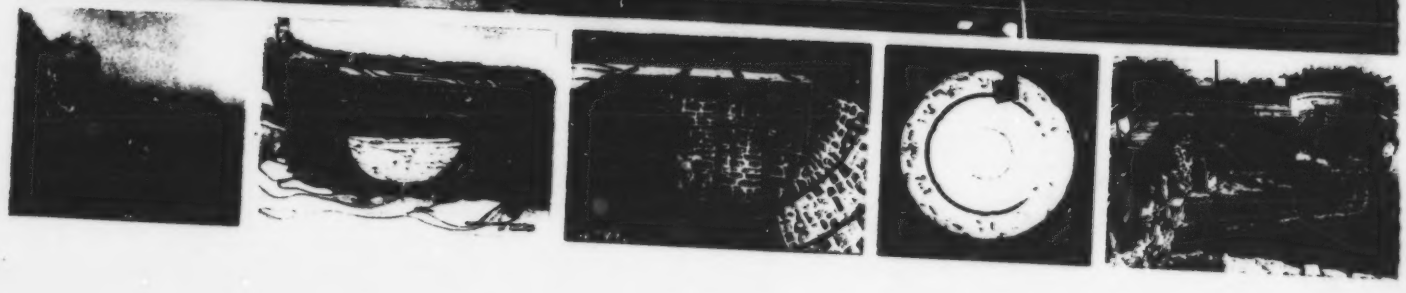
UNDER THE DIRECTION OF
PIERRE BEAUDET

UNDER THE BOARDWALK IN QUEBEC CITY



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Archaeological research is conducted by the **Canadian Parks Service** to understand, protect and develop the buried or submerged heritage in Canada's national parks and historic sites.

UNDER THE BOARDWALK IN QUÉBEC CITY

91-02067/

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OF PIERRE BEAUDET

UNDER THE BOARDWALK IN QUÉBEC CITY

Archaeology in the Courtyard and Gardens
of the Château Saint-Louis

septentrion

Design: Lévis Martin

Cover photos:
Main photo: Michel Élie
Others:
Exteriors: Michel Élie
Watercolours: Suzanne Duquet, from drawings by François Pellerin
Objects: Jean Jolin
Plant: Yves Boudreault
Duberger model: Jean Audet

Translation: Department of Secretary of State of Canada

Editing: Julia Gualtieri

Computer layout: Francine Brisson (Interscript)

Published by Guernica Editions Inc. under sub-license
from Diffusion Boréale Ltée in cooperation with
Environment Canada and the Canadian Government
Publishing Centre, Supply and Services Canada.

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Catalogue number R61-2/9-47E

ISBN 0-920717-52-7

Distributor: University of Toronto Press
5201 Dufferin St.
Downsview, Ontario
M3H 5T8

Guernica Editions Inc.
P.O. Box 633, Station N.D.G., Montréal (Québec) H4A 3K1

Éditions du Septentrion
1300, avenue Maguire, Sillery (Québec) G1T 1Z3

Canadian Cataloguing in Publication Data
Main entry under title:
Under the boardwalk in Québec City

(Essay series; 11)
Includes bibliographical references.
Translation of: Les Dessous de la terrasse à Québec.
1. Québec (Québec) — Antiquities.
2. Excavations (Archaeology) — Québec (Province) —
Québec. I. Beaudet, Pierre R. II.Series:
Essay series (Montréal, Québec) ; v 11.

FC2946.39.D4813 1990 971.4'47101 C90-090548-4
F1054.5.Q3D4813 1990

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Acknowledgements

This publication is the result of archaeological research carried out under the Dufferin Terrace from 1985 to 1987. The careful work of the field crews and site assistants including Geneviève Duguay, Robert Gauvin, Jean Grantham, Monique Moisan, Guy Plourde, Christian Poulin, Katherine Tremblay, and François Véronneau made it possible to explore the past under the best possible conditions. Even though his name does not appear under the title of any of this book's chapters, Jean Grantham was nevertheless behind many of them, particularly those dealing with the privies of the southeast courtyard and gardener Clancy.

We would like to emphasize the support of all our colleagues who helped in the research, particularly Roland Théberge and his technical services team, Diane LeBrun and her staff, as well as Cécile Morin and Hélène D'Amours of the C.P.S. Regional Library. Moreover, we would like to thank our colleagues involved in the conservation of historical resources, and in historical and material culture research, as well as those working for the Photography and Information Systems services, who gave us their expert collaboration.

We would also like to thank for their cooperation Maurice Gingras and his colleagues in Architecture and Engineering, the contractors and the staff of various documentation centres and archives. Sister Marie-Paule Cauchon, of the Archives of the Monastery of the Hôtel-Dieu in Québec, and Jocelyn Beaulieu, of the Archives de la Ville de Québec, were particularly attentive to our needs. Thanks also go to George L. Miller, of the Archaeological Excavations Office of Colonial Williamsburg, who provided us with several interesting leads concerning American icehouses, and also to Paul-Louis Martin for having taken the time to annotate the text and enrich it with a few pertinent phrases.

To the residents of the city of Québec and the clients and employees of the Château Frontenac, who were temporarily deprived of part of the Terrace, we would like to express our appreciation for their patience and for their interest in our research.

Pierre Beaudet
Monique Élie
Roxane Renaud

The thousand and one planks of the Dufferin Terrace.

(Canadian Parks Service, photo: Michel Gilet, 3BG82R1X-12)

Introduction

UNDER THE DUFFERIN TERRACE

Pierre Beaudet

The eyes of strollers who walk on the Dufferin Terrace in Québec City turn naturally to the majestic views offered by the St. Lawrence River and its neighbouring shores. But who would suspect the presence, under the boardwalk, of exceptional archaeological ruins that bear witness to various aspects of the rich history of the capital of New France, and of the British colonies in North America? The veil covering these archives in the ground was partly lifted during the excavation campaigns carried out by the Canadian Parks Service between 1980 and 1987.

Before being respectively sealed over again or placed in storage awaiting future site development, architectural remains and artifacts were the subject of specific studies, whose results are described in the following pages. However, before approaching the heart of the matter, let us review why and how the archaeologists of the Canadian Parks Service came to probe into the soil accumulated over the centuries under the Dufferin Terrace.

A New Face for an Old Beauty

The steps of thousands of visitors and the cycle of the seasons affect wood, as surely as the combination of air and rain gives patina to roofs made of copper. The Dufferin Terrace has to be occasionally refurbished — its planks replaced and foundations strengthened — in order to receive again the strollers who, in increasing numbers, come to discover one of the major jewels of an exceptional urban landscape now recognized as a World Heritage Site by UNESCO.

In the past, this work was carried out, by hand with pick and shovel, without much damage being done to remains of the previous occupations of the site. With modern excavation techniques, these archaeological deposits can be easily destroyed. This is why investigations were undertaken in 1980 at the time of major stabilization work.

Depending upon the presence of archaeological deposits and their relative importance, several sectors under the Terrace and its periphery were the subject of more or less extensive and careful research. Thus, were found ruins of several buildings and structures of various kinds and functions, which identified the traces of the successive occupations of the famous promontory.

Champlain ordered the construction of the first fort on the site in 1620. Over the years, the fort was rebuilt, the wooden fortifications replaced by masonry works, and the dwelling place demolished to make room for the Château Saint-Louis. The latter was enlarged many times, and gradually surrounded by outbuildings and other service facilities until it was destroyed by fire in 1834. The first Terrace, which was known as the Durham Terrace, was built in 1838 above the ruins of the Château. Its extension to the south, in 1854, led to the demolition of the outbuildings that had, until then, survived. Finally, the platform was extended to its present length in 1878, when it was named the Dufferin Terrace. Thanks to frequent refurbishings, it continues to offer an exceptional panorama to strollers, while protecting the archaeological archives resting under the boardwalk.

From One Campaign to Another

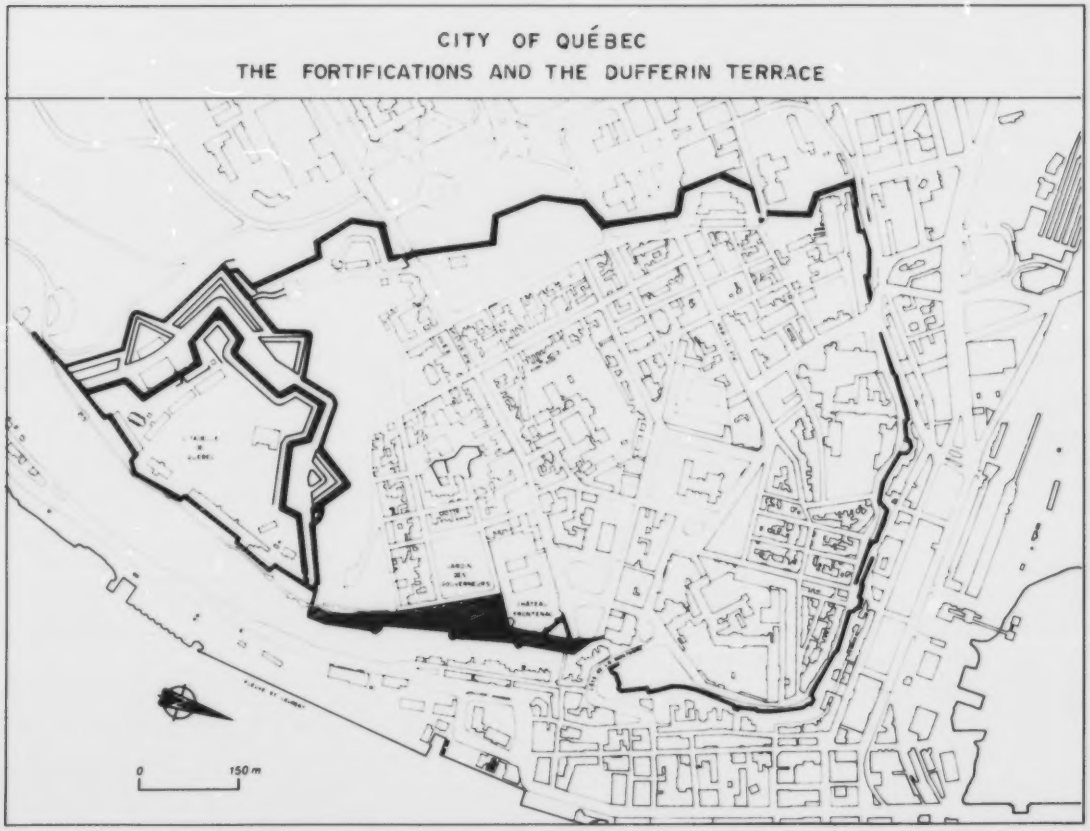
The first archaeological campaign (1980) was undertaken in the southern section of the Terrace. One of its objectives was to locate the remnants of a stable built at the beginning of the 19th century. The discovery of a chimney footing and a significant quantity of domestic objects and food remains, bear witness to the residential character of at least part of the building. A guard house, with massive stone walls that, today, measure over 4.5 metres in height, was also investigated by the archaeologists. Finally, the remains of fortification walls, and elements of several old drainage systems built in stone, brick, or wood were found in the vicinity of the Terrace supporting wall.

Archaeological remains uncovered in the southeast courtyard of the Château Saint-Louis.
(Canadian Parks Service, photo: Michel Élie; 38G86R37X-9)

The investigations carried out in 1981 made it possible to discover a domestic settlement and various defensive works. Now covered with grass, the sector located between Carrières Street and the Terrace revealed the architectural remains of two houses, one of French and the other of English construction, and remnants of a well, latrines, and sheds. The artifacts found in this well-defined context provided precious information on the identity and daily lives of their inhabitants.

In 1982, the archaeologists focused upon the sector of the Governor's Lower Garden and some elements of the defensive works. Vestiges of the town enceinte and of batteries dating from the 18th and 19th centuries were partly revealed. Another objective of that excavation campaign was to identify landscape elements — garden areas, paths, flora — which had, over the years, come and gone with the change of seasons and fancy. Testing in the area situated next to the enceinte of Fort Saint-Louis made it possible to determine that this was an area of very great interest, and that it should be the focus of excavations for the 1985-1987 period.

The following studies do not concern the research described above, whose results have been published elsewhere (see Bibliography). Rather, they are indicative of the most recent research carried out between 1985 and 1987 in the southeast courtyard of the Château Saint-Louis, and in a neighbouring area of the Lower Garden.



Old Québec, outline of the fortifications and location of the Dufferin Terrace. (Canadian Parks Service, drawing: François Pellerin; 88-38G-D15)

The Southeast Courtyard of the Château Saint-Louis and the Neighbouring Sector of the Lower Garden

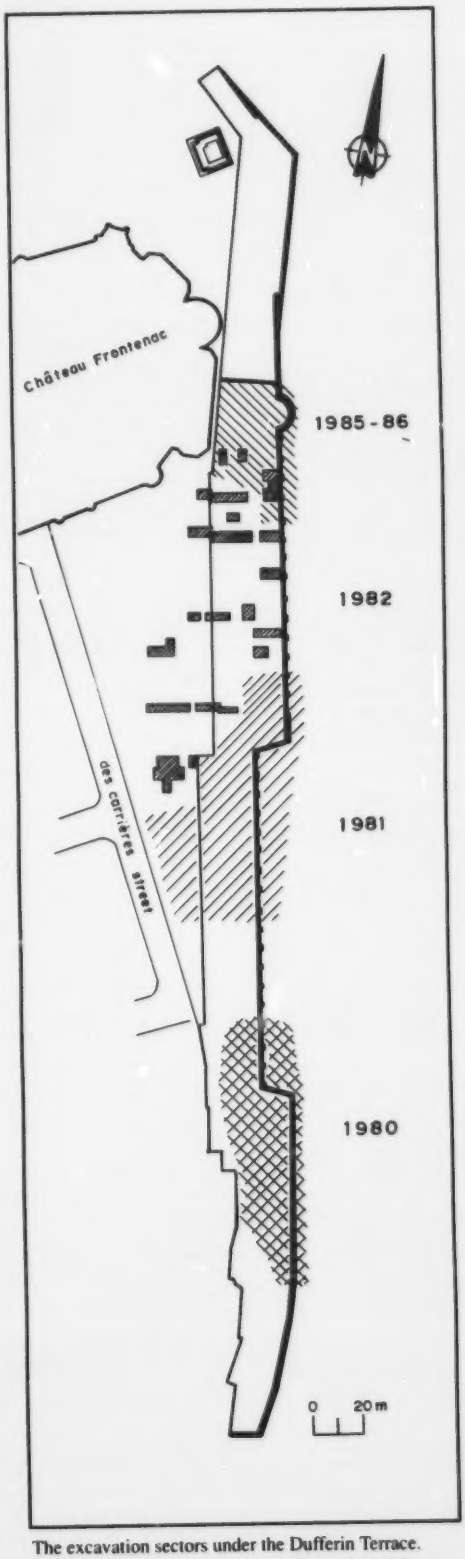
The area of the Terrace that was excavated in 1985 and 1986 provided a wealth of data, artifacts and structural remains that bear witness to the physical evolution of the site and the daily life carried out under the shadow of the Château Saint-Louis. We were aware of the importance of this area from the results of previous archaeological and geotechnical surveys as well as through a study indicative of a dense and varied occupation.

The superposition of historical plans showing the successive developments of the site and solid indicators concerning the stratigraphy of the soil were used to formulate an excavation strategy that was suitable to the kind, configuration, and size of the deposits involved. Other factors of a technical and logistic order were also taken into account, in order to coordinate our research with the facelift that the venerable Terrace was to undergo.

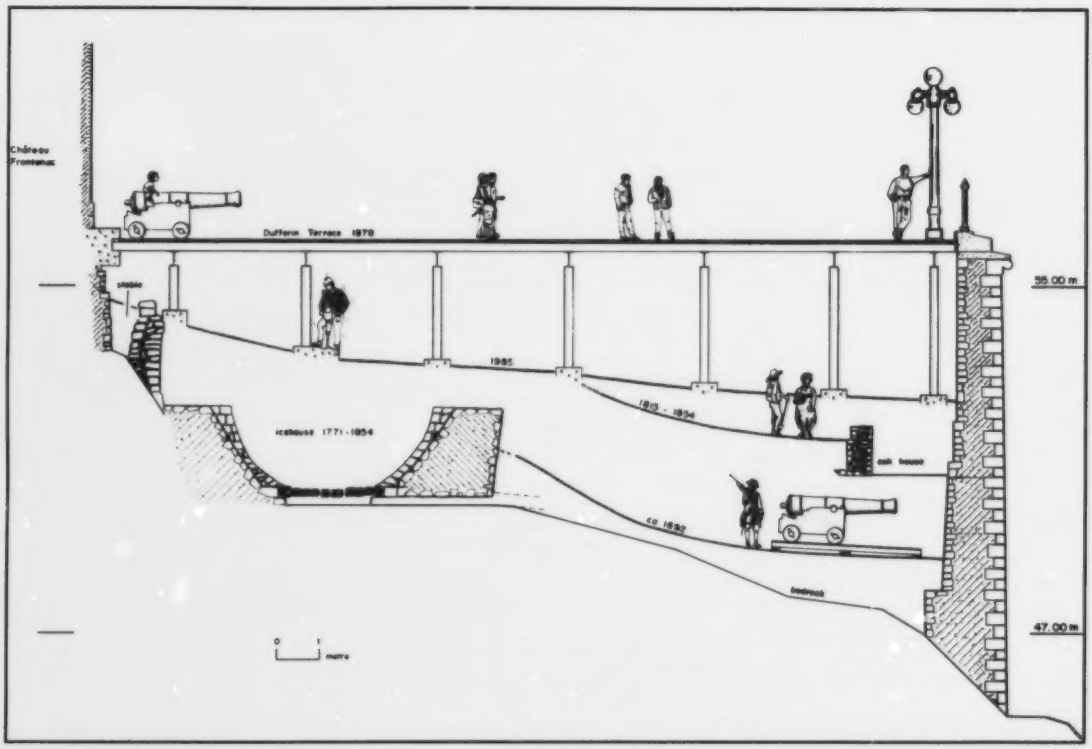
Taking into account the extent of stabilization work, the extraordinary wealth of the site, and the interest of the Canadian Parks Service in its future development, systematic and exhaustive excavations were called for in those sectors with the greatest potential. Elsewhere, monitoring and the recording of meaningful data would suffice to meet our needs. The vast excavation area extended over almost 750 metres square and was between 1.40 and 4.50 metres deep. Archaeologists were not disappointed, as almost each metre square of excavated ground delivered a significant clue or piece of the puzzle.

The investigations, which involved the collaboration of over 30 labourers, field assistants, draftsmen and artifact specialists, took place over a period of almost nine months distributed equally between 1985 and 1986. Monique Élie and Roxane Renaud, two Canadian Parks Service archaeologists, were responsible for directing these operations and the subsequent analyses.

The objective of our investigations was to better understand the occupation of the site through time and to study the various human activities that left significant remains in the ground. All the defensive works, service buildings, water supply systems, and the former status of the Terrace were described in a detailed resource inventory that takes into account each of the structural entities identified. The most promising avenues of research were selected in order to carry out more in-depth thematic studies.



The excavation sectors under the Dufferin Terrace.
(Canadian Parks Service, drawing: François Pellerin; 88-38(1-D9)



The depth of history: schematic cross-section showing various occupation levels in the sector of the southeast courtyard of the Château Saint-Louis.
(Canadian Parks Service, drawing: François Pellerin; 88-38G-D14)

Of War and Peace, Of Hot-Houses and Icehouses, Of Masters and Servants...

In the first chapter of this book, Roxane Renaud takes us down to the very bottom of the stratigraphic accumulation of the site; that is, to the early beginnings of its occupation. She describes the defensive works and objects of war which testify to the original purpose of this strategic location.

The icehouse of the Château Saint-Louis was the first service building constructed on the site. Monique Élie will introduce us to its exceptional architecture and various functions through examples that reveal the purpose and methods of ice conservation.

The archaeological research also produced abundant data on the horticultural practices that were carried out both under glass and out of doors in a large Québec urban garden, from the end of the 18th century until the middle of the 19th century. A chapter prepared by Roxane Renaud will describe these discoveries and place them in their cultural, geographic, and technological context. Geneviève Duguay will describe the collection of horticultural tools — plant pots and trays, glass bells, and flower boxes — found during the excavations.

FUNCTIONAL ENTITIES PRESENT ON THE SITE

DEFENCE

- First battery of the Château 1691-1740
- Southeast bastion of Fort Saint-Louis
- Powder magazine or guardhouse
- Second battery of the Château 1742-circa 1780
- Half-moon battery

THE TERRACES

- Durham Terrace, 1838 and 1854
- Dufferin Terrace, 1878 and subsequent refurbishings

VARIOUS DRAINS

- Masonry drain, circa 1815
- Spillway and drain, 1815-1854
- Drain, circa 1880

THE OUTBUILDINGS

- Icehouse
- 1781-1815 hot-house
- 1815-1854 greenhouse
- Latrines
- Stable and carriage house
- Wood shed
- South end of the laundry
- Unidentified building
- 1815 greenhouse lean-to
- Ash house

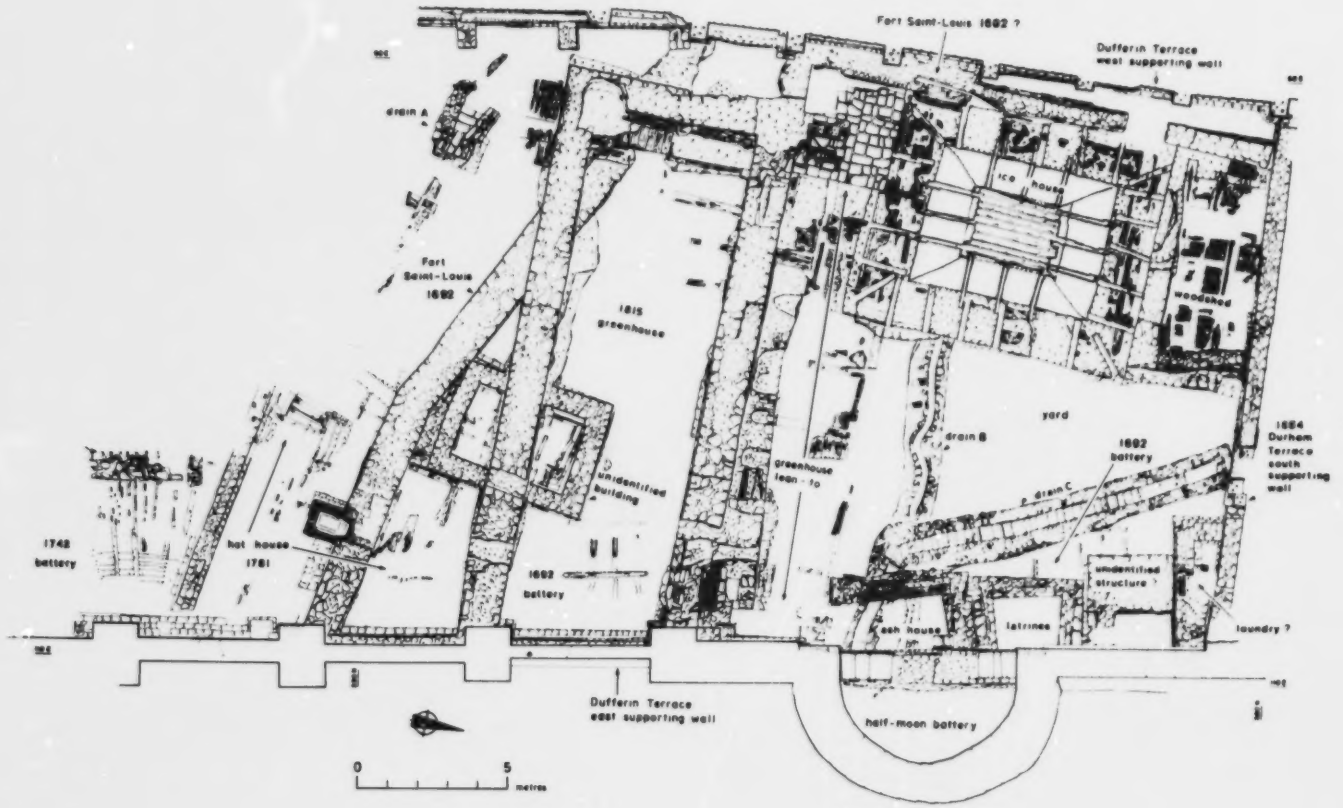
Table 1

Monique Élie, in "Masters or Servants?" describes the difficulties involved in interpreting archaeological objects recovered from sites frequented by people of very different backgrounds. This study illustrates the exceptional interest of the artifacts found under the Terrace.

Darlene Balkwill and Catherine Fortin will introduce us to the diet of people who lived on the site around the first half of the 19th century, and emphasize some aspects of an environment in the midst of change. The first study was based on information provided by thousands of domestic and wild animal bones; the second derives its conclusions from the study of a considerable number of plant remains recovered from the latrines which stood near a building that was used first as the kitchen of the Château, and later as the house of the gardener.

To round out this volume, Geneviève Duguay presents an illustrated retrospective of the 150 years in the life of the Terrace. When we look at the wealth of these archives hidden in the soil and these illustrations of past times, how can we not be convinced that it is by far the most picturesque, prestigious, and attractive site in the old capital? A place so rich in history and landscape that, by itself, it has come to define and characterize the city of Québec.

P. B. ■



88-38G-D12, F.Pellerin

Chapter 1

"FROM THE MOUTHS OF MY CANNON AND MUSKETS"

Roxane Renaud

When the boardwalk of the Dufferin Terrace was lifted in the spring of 1985, the archaeologists were astonished to find, half-buried in the surface rubble, an object they had never seen in their previous excavations. The containers used to collect artifacts suddenly seemed ridiculously small, as the researchers came face to face with a heavy gun carriage that had to be pried from its resting place by a powerful crane with a telescoping boom. The archaeologists had hardly expected to be greeted by such a find in the first day of excavation! However, they view this dramatic discovery as added confirmation of the richness of the site. According to the literature, this sector of the Terrace had played an important role in the history of the fortified town and between 1980 and 1983 several defensive structures had already been found in this location. The remains of a few batteries and a guardhouse, as well as the fortifications along the cliff, were carefully scrutinized both during the systematic excavation campaigns, and during the stabilization work.[1] (Fig. 1.1)

This time, the excavation has revealed military structures dating from the fourth version of Fort Saint-Louis, a masonry construction erected by Frontenac between 1691 and 1693 and gradually abandoned during the second half of the 18th century. Research made it possible to identify imposing remains of the two faces and the right flank of the southeast bastion of the fort and of the battery of the Château, half of which was demolished and the other half reconstructed in the 1740s. A masonry building, the presence of which was a surprise to the archaeologists, and artifacts bearing witness to military activities carried out at the time were also recovered. Before attempting to describe these discoveries, let us review a few highlights in the history of Fort Saint-Louis in the years before Frontenac arrived in New France.

1.1 The fortification wall that serves to support the present Terrace, during the time of Cockburn.
(Aquatint based on a drawing by J.P. Cockburn; Musée du Québec, photo: Patrick Altman; G 53. 106 E [2] 1)

[...] selon l'oyseau, il falloit la cage [...]

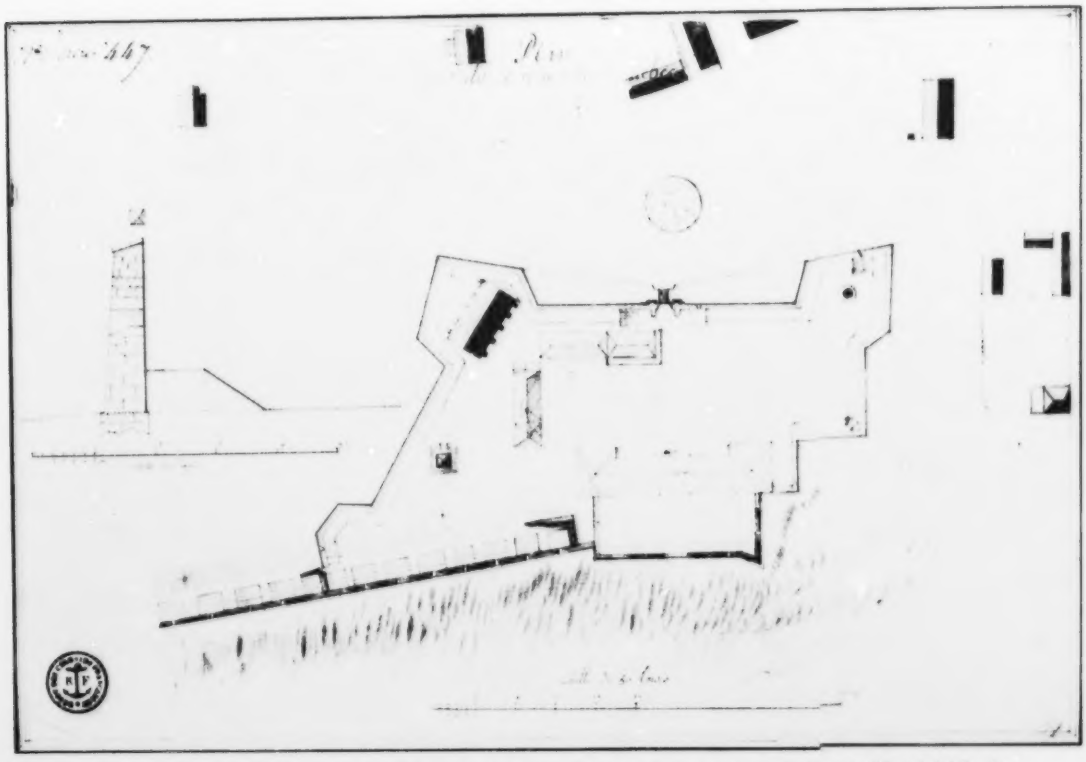
(Champlain, 1626)

THE FORTS OF CHAMPLAIN AND MONTMAGNY

When Champlain decided to establish his colony in Québec, it was undoubtedly because the promontory and the narrowing of the river in this location offered excellent natural protection. In 1608, he settled close to the river, and his "Abitation" was built both as a housing facility and for the storage of provisions. This structure was also designed as a rudimentary defensive retreat.[2] Faced with the threat of ever-increasing numbers of enemies, Champlain took measures to improve the defensive works of his "Abitation". In 1620, he decided to avail himself of the strategic advantages offered by Cap-Diamant: a fortress built on the heights dominating the "Abitation" would offer better protection. He thought that if the St. Lawrence River had provided the way for him to reach Québec, it could well offer the same opportunity to others... Henceforth it would be from a wooden retreat built on the top that sentries would be on the lookout for the enemy. A few years later, Champlain ordered the reconstruction and the enlargement of the structure. In case of attack, the *réduit* should be sufficiently large to accommodate all the inhabitants. Champlain also gave orders to build his own dwelling, a modest version of the first Château Saint-Louis:

> *[...] celuy qui y estoit avoit esté assez bon pour peu de personnes selon l'oyseau il falloit la cage, & que l'agrandissant, il se rendroit plus commode, qui me fit resoudre de l'abattre & de l'agrandir [...].*[3]

Work on this project continued over a period of some ten years, until the death of the founder in 1635. The following year, Montmagny, the new governor, decided that the wooden fortress was no longer adequate for the defence of the colony which was being constantly threatened by the English and Iroquois. Consequently, he had the fort reconstructed; however, this time, he used masonry in order to improve, if he could, a structure that had, until that time, required regular repairs.[4] He wished the work to be done in accordance with the rules of the art of fortification. Including repairs, this ambitious project would take more than 25 years; that is, until the arrival of a new governor whose thunderous words have become so famous.



1.2 The southeast bastion and the battery of the Château. Project designed by Villeneuve for the enlargement of Fort Saint-Louis.
(National Archives of Canada: C-15900)

> *[...] je n'ai point de réponse à faire à votre général que par la bouche de mes canons et à coups de fusils [...]*
>
> (Frontenac to Phips' envoy, October 1690)

THE SOUTHEAST BASTION OF THE FORT BUILT BY FRONTENAC

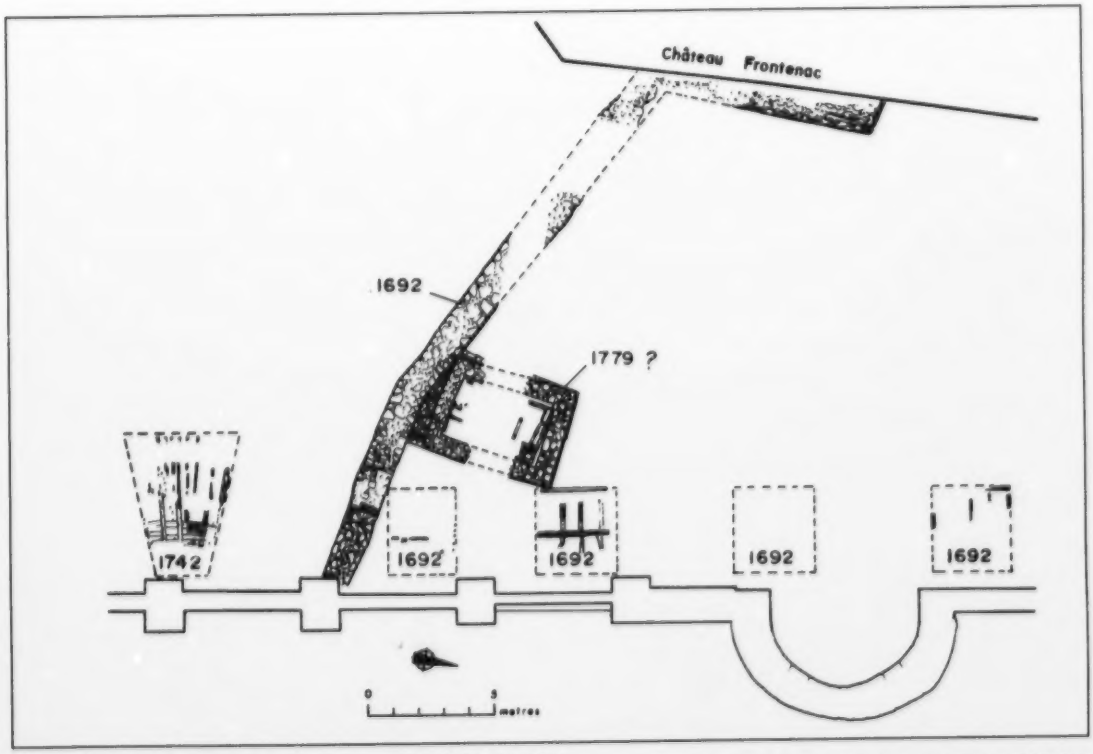
After the attack by English troops commanded by Phips in 1690, Governor Frontenac gave orders for the reconstruction of the enceinte in the same location, and for the installation of batteries on one side and the other of the left face of the southeast bastion of the fort. This time, the work was carried out very quickly and, in 1693, the fort which had been designed by Villeneuve took its final form (Fig. 1.2).

In 1692, the specifications presented by Frontenac to those in charge of the work added a few details concerning the techniques to be used to construct the enceinte. The curtain walls and bastion masonry works should rest on bedrock, have a thickness of four French feet at the base, and be suitably high.[5] As for the stonework, the outside facing would be made of Beauport stone or sandstone from Cap Saint-Claude, and the inside facing from Québec stone. In November 1693, Intendant Champigny described the structure as a simple stone wall sixteen feet high and adequately thick, behind which simple scaffolds without terrepleins would in time be built, in order to fire *à barbette*, above the wall.[6]

Until the time of the Conquest, the enceinte was repaired many times, but no major modifications were made. In the second half of the 18th century, it was slowly abandoned by the English, who thought it could no longer be of service.

> *This fort incloses the governor general chatiault a few small Magasines which seems to be the whole use fort [sic] it. It defends nothing, it is at presents praticable neither for canons or small arms.*[7]

Impressive remains of the southeast bastion walls have been found under the Dufferin Terrace, very near the Château Frontenac (Fig. 1.3). Excavations have cleared a section of the wall which



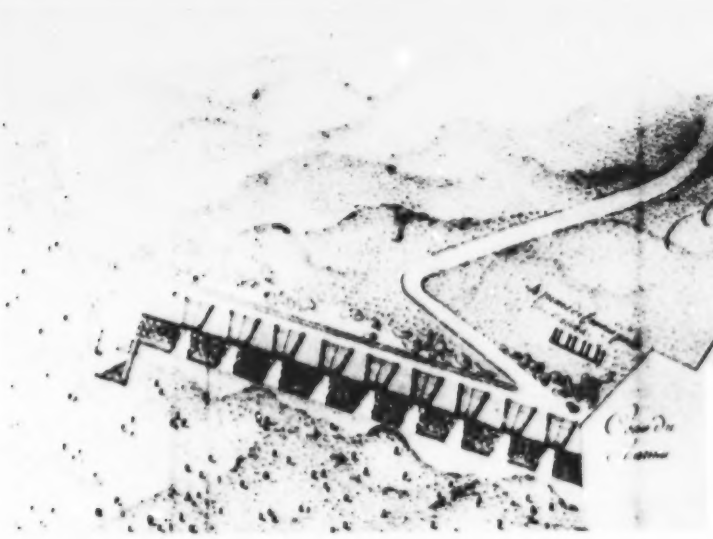
1.3 Defensive works of Fort Saint-Louis excavated in 1985 and 1986. (Canadian Parks Service, drawing: François Pellerin; 88-38G-D10)

extends over four metres high near the edge of the cliff, and revealed that, in fact, the foundations rest on bedrock, as specified in the document. The work had been leveled during the course of previous renovations. For example, the east end of the left face was demolished to make room for the retaining wall of the Dufferin Terrace. Only the lower foundations of the right face of the bastion were still evident under the remains of a greenhouse built in the same location in 1815. The right flank had been cut off from its outside facing by the construction in the 20th century of a restaurant adjoining the Château Frontenac.

At this point, it would be useful to say a few words about the size of those sections of the structure that were spared. Running over a total length of 31.70 metres, the wall measures between 1.00 and 1.40 metres wide at its base. These dimensions correspond rather closely to the four French feet (1.23 m) specified in the 1692 contract. The lengths of the right flank (8.50 m) and of the left face (15 m) correspond perfectly with the dimensions shown on a plan drawn at the end of the 17th century after the work was completed.[8] The materials used in the stonework for the wall consist mainly of limestone blocks and rubble, a few sandstones, and bricks, whose presence is evidence of later repairs. The rubblework consists of pieces of shale and limestone held together by mortar. The arrangement of the stones in the facings is not regular, especially in the lower part of the remnants, where the blocks were no more than roughed out and propped up in certain locations against the construction trench.

The opening designed by Villeneuve in the centre of the left face of the bastion was located during archaeological excavations carried out in 1985. This postern would have been used by the gunners responsible for the Château batteries located on both sides of the fortification. The bevelled opening in the thickness of the wall measures 1.92 m on the inside and 1.56 m on the outside which leaves little room for the passage of heavy artillery pieces and carts. This passage does not appear on any plans dating after the end of the 17th century.

1.6 12-pound cast-iron carronade carriage as it was found under the Terrace. (Canadian Parks Service, photo: Michel Élie; 38G85R6X-9)



1.4 Plan of the battery of the Château reconstructed in 1742. (National Archives of Canada: C-42462)

[...] depuis la construction du fort en 1620, on s'était quand même appliqué à rendre sa position plus solide, en établissant des batteries aux points faibles et en dressant des canons du côté de l'est d'où on attendait l'ennemi.[9]

THE CHÂTEAU BATTERY

In 1685 the town plans show for the first time cannons located outside the fortifications of Fort Saint-Louis.[10] At the same time as he was working to enlarge the fortress, Frontenac was able, between 1691 and 1693, to complete the battery. It consisted of 17 rectangular platforms, nine of which were built outside the fort, and eight inside. Originally, these structures were hidden behind a wall of stones laid dry, measuring one and a half French feet in width, and pierced by embrasures which were covered, under orders from Beaucours, with a row of gabions in 1712.[11] Thirty years later, the section located inside the enceinte was abandoned. Under orders from the engineer, Chaussegros de Léry, the outside platforms assumed a trapezoidal shape[12] (Fig. 1.4). The new structure was protected by a wall over three feet thick reinforced by a large row of gabions. However, it was finally abandoned shortly after the Conquest, because, on the west side, there was now a rampart running north to south that could secure the protection of the town.[13]

A few flimsy wooden remnants, found more than seven metres under the level of the Dufferin Terrace, still bear witness to the existence of these two batteries. Inside the southeast bastion of the fort the archaeologists were able to determine the locations of four equidistant rectangular platforms, as they found in some sites a layer of heavily decayed wood over the natural clay soil. Even though the floor of the platforms had completely disappeared, the position of sleepers made of white cedar, joists made of soft wood, and the presence of forged nails still in place, provided a clear indication of the construction techniques used and the scale of the structure. Three sleepers had been laid on the ground about 1.50 m from one another, and five or six joists had been laid crosswise over them, 60 cm apart. This solid infrastructure was used to support the platform timbers which were attached using large nails, every 24 cm, in a north-south direction. The final structure formed a platform measuring about 3 metres by 2.5 metres. The four structures found were at the bottom of the slope described by the profile of the site developed at the end of the 17th century. In accordance with the general principles of fortification, the surface was slightly higher at the back than in front in order to counterbalance the thrust produced when the guns recoiled.[14] We have estimated that the number of cannons (or mortars) that could fire from inside the fort could be as high as eight, if we take into account the distance separating these platforms from the remnants of the Château Saint-Louis located under the north end of the present Terrace. This corresponds perfectly to the plan drawn by Villeneuve for the enlargement of the fort (Fig. 1.2).

The first battery left no apparent traces of its existence outside the southeast bastion; however, remnants of its reconstruction in the 1740s are still in place near the imposing wall (Fig. 1.3). This time, the wood remains mark the location of a trapezoidal platform like those that appear on the plan drawn by Chaussegros de Léry in 1742 (Fig. 1.4). The white oak timbers were laid in a north-south axis, as in the case of the first battery, and nailed to nine cedar

joists arranged in a fan shape and separated by 20 to 50 centimetres. The width measured at the back of the remains is about four metres, while the estimated length of the structure is four to five metres. There was a slight slope in the platform from back to front. According to the plan drawn by Chaussegros, nine platforms should have been reconstructed outside the enceinte; however, archaeologists were able to find only one during their excavations on the site of the Dufferin Terrace. It has been impossible to determine accurately the layout of the battery. Because of the advanced state of decomposition of the remains, the true dimensions of the platform are not known. The presence of creamware in the fill covering the structure indicates that it was abandoned between 1770 and 1780, when the site ceded its primary defensive role to the activities related to the outbuildings of the Château Saint-Louis.

AN UNEXPECTED DISCOVERY

Under the foundations of an imposing greenhouse were revealed the walls of a masonry building that appears only on one 1779 plan[15] (Fig. 1.5). The document shows a small square building in the gorge of the southeast bastion; however, its purpose is not described. Despite the small size of the building (5.35 m X 3.95 m), the limestone walls are 0.75 m thick. They are not cut by any openings. The inside facing of the four walls is covered with a thick coat of rough plaster to the level of a pine floor, whose insubstantial remains can still be found a few centimetres above the rock. The artifacts — among others, creamware and pearlware — recovered from the rubble that filled the inside of the small building, and

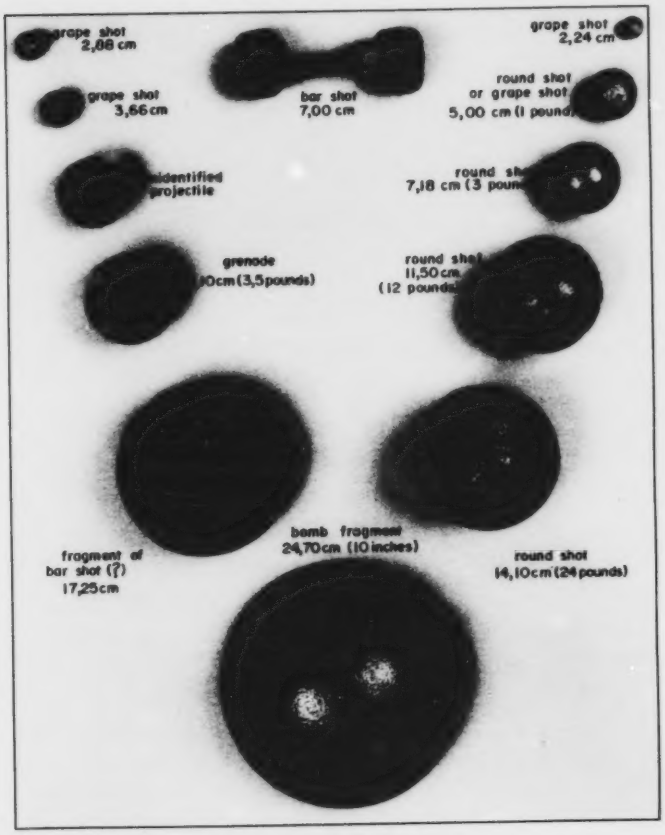
1.5 Building of unknown function discovered under the remnants of a greenhouse. (Canadian Parks Service, photo: Michel Élie; 38G86R126X-9)

from the underlying floor level, indicate that it was abandoned around 1780. These rather domestic objects did not seem to have any relationship with the specific function of the building. Because of the level of the floor, which corresponds to that of the adjacent battery, the lack of any openings, and the approximate date when it was abandoned, archaeologists believe that the building was related to the military activities of the site. Since it was common practice to build near the batteries a small magazine where the necessary gunpowder could be kept:

> *It is usual to make little cells or cavities near to the battery, at a convenient diftance, in which to keep the gunpowder. These cells [...] are [...] called little magazines of the battery.*[16]

REMNANTS OF MANY BATTLES

During the bombing of Québec, the stronghold that once extended under the Terrace was undoubtedly a choice target. Cannon balls, bomb fragments, grape shot, and the smell of sulfur emanating from the oldest occupation levels in the site can still vividly bring to mind the horror of war. But first, a few words about the heavy gun carriage mentioned above (Fig. 1.6). The manufacturer's stamp reveals the English origin of the carriage, which is similar to the carronade carriage still in place in Fort Lennox on the Île-aux-Noix.[17] This piece of artillery, which is shorter and lighter than cannon, was first used by the British in 1779. Its main use was as artillery for the garrison assigned to the defence of the permanent fortifications.[18] The reason for the presence of the gun carriage in the rubble is not known; however, it may have been abandoned during the work carried out in the 19th and 20th centuries to renovate the Terrace, after it had been used in one of the batteries in the sector.



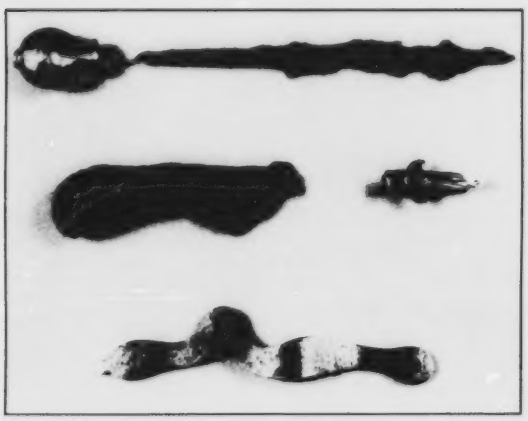
1.7 Cast-iron artillery projectiles from the Terrace site.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-20)

1.10 Buttons from military uniforms. From top to bottom and left to right: brass, VRI (Victoria Regina Imperatrix, 1876-1901); iron and tin, 68th Regiment, first half of the 19th century; tin, 60th Regiment, probably 1759-1800; copper, Royal Artillery, ca. 1785-1802; tin, 70th Battalion, first half of the 19th century; copper alloy, Royal Artillery, 1802-1820.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-179)

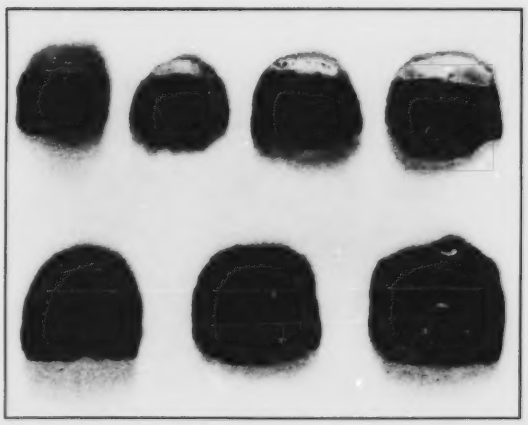
The discovery of the gun carriage was certainly spectacular, but other signs of defense were also found, mainly in the levels corresponding to the time when the batteries were abandoned (Fig. 1.7). Over fifty bomb fragments with diameters of up to 36 centimetres were removed from the oldest layers. A few of these heavy, hollow cast iron balls were equipped with two handles and pierced by an opening, called a priming-hole, through which the powder was put in. This opening was then plugged with a wooden fuse, also filled with powder, which was used to fire the ball.[19] One of these fuses, made of beechwood, and still containing traces of sulfur, was found under the Terrace among some bomb fragments. This object could also have been used as a grenade fuse. Archaeologists found a few of these small hollow projectiles, each pierced by a hole, which could be thrown manually rather than using a mortar.[20] Another object that played the same role as the bombs and grenades had to undergo several laboratory analyses before it was possible to determine its composition and to identify it properly. It consists of a cylindrical box made of tinplate and containing some thirty small lead balls and a tarry substance (pine resin), as well as sulfur and hair. This caseshot canister, which also contained hemp fibres and two small pieces of wood, and could have been used as a wick or fuse for firing, was set in motion in the same way as a bomb.[21] Many cannon balls of various sizes completed the collection of projectiles recovered from the site of the Terrace. Some double-headed bar shot, which were generally used to dismast and sink ships,[22] are clear evidence of the proximity of the river and the danger of enemy raids from that side of the town.

The use of firearms on the site was evidenced by the discovery of gun parts (Fig. 1.8), ammunition, and firing equipment. For example, the presence of a side plate, a buttplate, cartridges, and lead shot of all sizes, firing caps, friction tubes, and gunflints (Fig. 1.9) attest to the presence of soldiers — or small game! — in the vicinity.

Some objects remind us that men in military uniforms were a common sight in that location for more than two centuries. Many uniform buttons (Fig. 1.10) represent the regiments that by turns ensured the defense of the town. Regardless of whether it is a tin button lost from the jacket of a simple soldier, or the brass button of a senior officer,[23] their discovery is a reminder of those men whose exploits and defeats have left such an important mark on our history.



1.8 Gun and sword parts. From left to right: sword pommel, in copper alloy; sword blade (?), in forged iron; iron tip for the handle of a cavalry sabre; fragment of the buttplate of an English gun of the last quarter of the 18th century, made of copper alloy; side plate of a Long Land gun (c. 1730-1780), made of copper alloy.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-176)



1.9 Dutch gunflints; top: grey-blond flint; bottom: grey flint.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-185)

These detailed descriptions of the changes undergone by the first fortification on the site and the military customs and practices of the time can enrich our understanding of the methods used by the authorities in the colony to defend it against its enemies.

Just as interesting are the discoveries that speak to us of the domestic day-to-day life in the fortified enceinte. Matter was being organized, given shape, and varied activities carried out which in turn would leave their own clearly recognizable traces.

R. R. ■

ARCHAEOLOGICAL DISCOVERY

The work carried out to extend the Durham Terrace on the site of the old Château and Fort Saint-Louis have recently led to the discovery of an interesting archaeological relic. When demolishing the old wall separating the enceinte of the fort from the outlying garden, two heavy monumental stones were found in one of the corners of the wall. These contained a copper plate carrying a Latin inscription that we reproduce here with its translation. [...] [In the year of grace one thousand six hundred and ninety-three, in the reign of the most august, invincible, and Christian King of France, Louis the Great, 14th of that name, the most excellent Louis de Buade, Count of Frontenac, for the second time Governor of all New France [...], has caused this citadel with its adjacent fortifications to be built, at the expense of the King [...]. — And has laid this corner stone.]

Le Canadien, 1 September 1854

NOTES AND REFERENCES • CHAPTER 1

1. Readers interested in these subjects may consult the reports produced by Monique Laliberté, William Moss, and Gisèle Piédalue, cited in the bibliography.

2. A. Charbonneau, Y. Desloges, and M. Lafrance, *Québec, ville fortifiée du XII^e au XIX^e siècle* (Québec, Pelican and Parks Canada, 1982), p. 20-21.

3. Samuel de Champlain, *The Works of Samuel de Champlain*, Biggar, editor (Toronto, The Champlain Society, 1933), vol. V, p. 204.

4. Jesuits, *The Jesuit Relations and Allied Documents* (1636), ed. Thwaites (New York, Pageant Book Co., 1959), vol. IX, p. 136, cited in Jeannine Laurent and Jacques St-Pierre, *Les forts et châteaux Saint-Louis, 1620-1760*, Microfiche Report No. 40 (Parks Canada, Ottawa, 1982), p. 42.

5. Archives nationales du Québec, "Marché entre François de Lajoue et Hilaire Bernard de la Rivière et le comte de Frontenac et Monseigneur de Champigny Noroy," 28 September 1692, cited in J. Laurent and J. St-Pierre, *op. cit.*, p. 110.

6. Frontenac and Champigny to the Minister, 4 November 1693, *Rapport de l'archiviste de la province de Québec pour 1927-1928* (Québec, Rédempti Paradis, 1928), p. 171, cited in J. Laurent and J. St-Pierre, *op. cit.*, p. 112.

7. National Archives of Canada (NAC), MG 18, M1, vol. 32, Northcliffe Collection, General Robert Monkton Papers, 20 October 1759, cited in J. Laurent and J. St-Pierre, *op. cit.*, p. 173.

8. NAC, C-15902 (see J. Laurent and J. St-Pierre, *op. cit.*, Fig. 28).

9. Marcel Trudel, *Initiation à la Nouvelle-France: histoire et institutions* (Montréal, Holt, Rinehart and Winston, 1968), p. 179.

10. NAC, C-15797 (see J. Laurent and J. St-Pierre, *op. cit.*, Fig. 11).

11. J. Laurent and J. St-Pierre, *op. cit.*, p. 116.

12. *Ibid.*

13. M. Trudel, *loc. cit.*

14. A. Charbonneau, Y. Desloges and M. Lafrance, *op. cit.*, p. 88.

15. Archives du Séminaire de Québec, Drawer 213, No. 4, "Plan of Fort St. Louis at Quebec, commonly called the Chatteau," by Henry Marr, 1779.

16. LeBlond, *A Treatise of Artillery* (Ottawa, Ontario, Museum Restoration Service, 1970, republication of the translation published in London by E. Cave, in 1746), p. 69.

17. S. James Gooding, *An Introduction to British Artillery in North America* (Ottawa, The Runge Press Limited, 1972), p. 9.

18. *Ibid.*, p. 27.

19. LeBlond, *op. cit.*, p. 50.

20. *Ibid.*, p. 58.

21. Leslie W.C. Barnes, *Canada's Guns — An Illustrated History of Artillery* (Ottawa, National Museums of Canada, 1979), p. 27.

22. S.J. Gooding, *op. cit.*, p. 40.

23. J. Duncan Campbell, "Military Buttons," *Mackinac History* (Mackinac Island, Michigan, Mackinac Island State Park Commission, 1965), Leaflet No. 7, p. 1.

Chapter 2

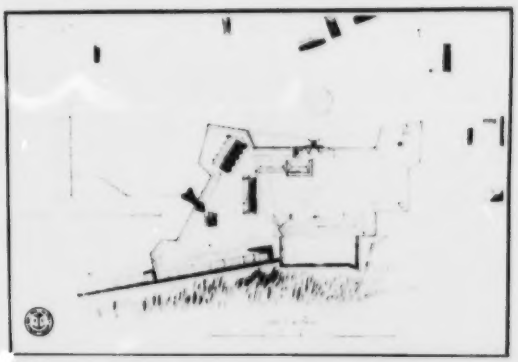
AMONG THE OUTBUILDINGS OF THE CHÂTEAU, AN ICEHOUSE

Monique Élie

On a warm summer night, what could be more refreshing than sitting on the gallery enjoying a most delicious frozen dessert? Lady Aylmer and her husband, the Governor, could enjoy these pleasures not only in their residence in Montréal, but also in their summer house in Sorel, and in the Château Saint-Louis in Québec. Well-stocked icehouses provided their cooks with a continuous supply of ice for the preparation of these desserts which were decidedly "fit for the gods."[2]

The icehouse, which was designed to keep winter snow and ice for use in the summer,[3] has certainly contributed to the delight of the most discriminating palates. Like the refrigerator and freezer of today, it also played an important role in food preservation, and in soothing everyday aches and pains. Before we look at the benefits of having a "permanent" supply of frozen water, let us steal a glance at how our ancestors stored and preserved this precious substance, particularly at the Château Saint-Louis where an icehouse was unearthed among the outbuildings.

> *Now that the Gallery before our house is repaired we shall take our Coffee and Ice there and keep au frais, this warm weather.*
>
> (L.A. Aylmer, 10 June 1831[1])



2.1 The icehouse is the small square building located near the curtain wall. The drain is drawn with a broken line.
(*Plan du château de Québec* by Sieur de Villeneuve; National Archives of Canada: C-15900)

How to Obtain Good Results with an Underground Icehouse

During the siege of Petra, Alexander the Great, who wanted to keep a supply of snow for the summer, ordered the excavation of thirty trenches that were filled with snow and covered with brushwood and leaves.[4] Undoubtedly, people had already taken notice of the fact that the snow that piles up during the winter in places such as ditches and gullies that are never touched by the sun can often last throughout the year. By the 16th century, many Mediterranean countries were already collecting snow in the mountains and storing it in caves and pits located lower down the slope, in order to meet the needs of coastal populations.[5] In France, even though the word *glacière* does not seem to have been in common use before 1640, the future Henri II and his son Henri III had already enjoyed the luxury of ice.[6] Finally, the idea of storing ice spread to England and America during the course of the 17th century.[7] In 1665, the Governor of Virginia received letters patent allowing him to keep ice and snow "in such pits, caves and cool places as he should think fit [...]."[8] In New France, shop owners and innkeepers were among the first to build icehouses for themselves.[9] In 1684, the Jesuits of Québec already had a supply of ice at their disposal at the height of summer.[10] Plans show that an icehouse was used at the Château Saint-Louis as early as 1692 (Fig. 2.1). And, even though this type of construction did not start to spread into the countryside before the middle of the 18th century, the seigneur of Lauzon had already availed himself of an icehouse by the 17th century.[11] Thus, it is not so surprising that, in 1749, Pehr Kalm commented upon the existence of such comforts in the homes of Québec's upper class.[12]

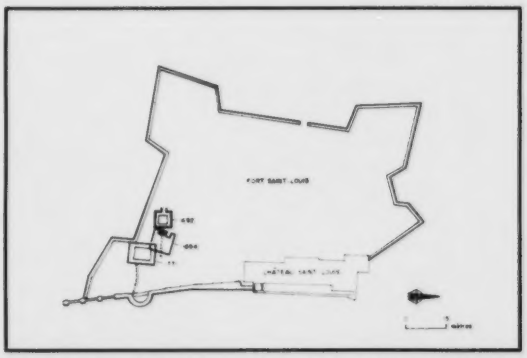
In 1771, a new icehouse — traces of which were discovered under the Dufferin Terrace — was built next to the Château Saint-Louis. Its effectiveness depended not only upon its location, infrastructure, shape and volume, but especially upon its resistance to humidity and heat, and the ingenuity of the method used to stock it.

Location: A Perfect Blend of Practicality and Esthetics

The ice storeroom described by the Swedish voyageur Pehr Kalm consisted of a cellar dug under the body of the building. On the other hand, the icehouses built on the shores of the St. Lawrence and described by Baroness de Riedesel some thirty years later, were built close to each individual house.[13] This could be explained by the fact that most country houses in the 17th century and the first half of the 18th century had no basements.[14] For all sorts of reasons, for example, to build them near the source of the ice, to group them with other outbuildings, or even to integrate them into the gardens,[15] other icehouses were built away from the houses, at times a little too far away for the taste of the owners. In Montréal, the Grey Nuns of the Hôpital Général complained that the icehouse they built in the 19th century, on the site of the windmill belonging to the Charon brothers, was too far away for convenience.[16]

At the Château Saint-Louis, the French icehouse was located several metres to the south of the Governor's residence, quite near the southern curtain wall of the fort. After 1694, it is drawn at the eastern end of the curtain wall rather than toward the centre. Could this be the result of a reconstruction, or merely lack of accuracy in the plans? In 1771, the British built a new icehouse a little farther to the east, beyond the junction of the southern curtain wall and the southeast bastion of the fort.[17] However, the distance separating it from the building remained just about as convenient as it was before (Fig. 2.2).

While many icehouses consist of nothing more than a simple ice reservoir, some constructions may also include a dairy, or a cold chamber. Others, in order to fit more gracefully into the landscape of a Parisian garden of the 19th century for example, were crowned with a gazebo, a dovecote, an Egyptian dance room, or even fronted by a Chinese pavilion![18] The icehouse shown on the plans of Fort Saint-Louis at the time of Frontenac was probably more than just an ice storeroom since a wooden floor had been built over the reservoir. The structure that replaced it in 1771 certainly had a cold room that could be used to store perishable goods. It was separated from the gardens by walls and buildings, and seems to have lacked any of the embellishments which became fashionable in the next century.



2.2 Locations of the icehouses of the Château during the French and English regimes (Drawing made from Fig. 2.1 [circa 1692], the *Plan de l'enceinte de la ville et château de Quebek en 1694* [NAC, C-21761], and the survey of the icehouse unearthed under the Dufferin Terrace [1771]).
(Canadian Parks Service, drawing: François Pellerin; 88-38G-D8)

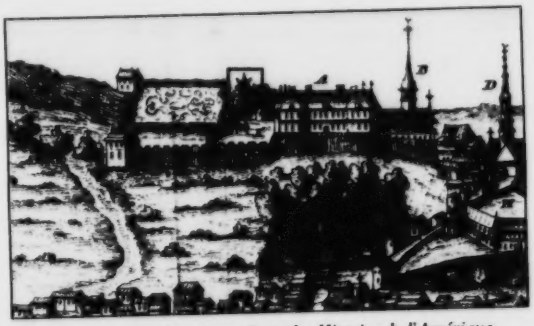
The Pit: The Excavation and Lining

Like Alexander's ice pits, the Laurentian icehouses could be built, according to Baroness de Riedesel, in the simplest possible way. It was only a question of making a hole in the ground and filling it three-quarters of the way up with ice and water which would then freeze and stop all the cracks.[19] However, underground icehouses could not always be built so easily, especially if they were intended for permanent use. Supporting the walls of a pit dug in loose or unstable ground, for example, required the construction of solid and water-tight walls. Depending upon the materials available, the volume of ice to be stored, and how long-lasting a structure was desired, the walls were built of wood, brick, or stone.

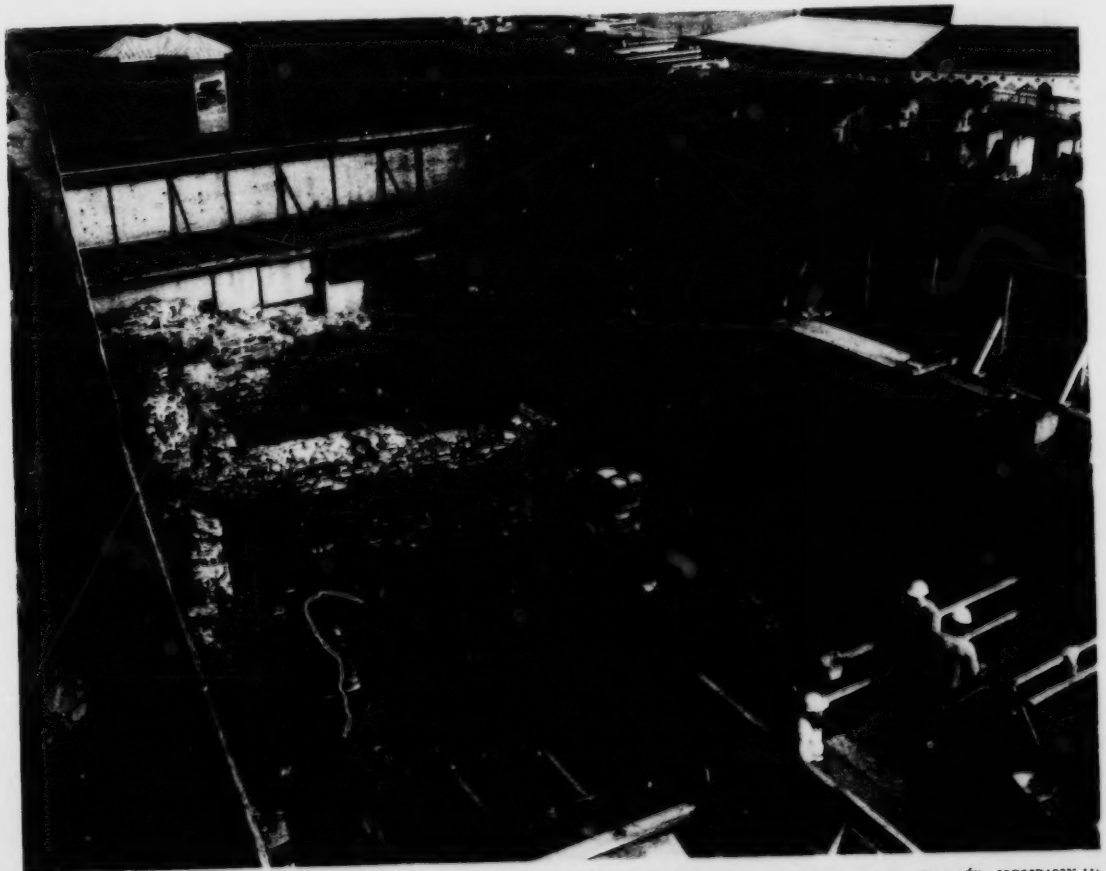
In 1803, in an essay dealing with the construction of icehouses, the American farmer Thomas Moore wrote that the best structures used a wooden framework to line the walls.[20] In Québec, this technique was used, for example, in the 1740 icehouse unearthed by Parks Canada archaeologists in the Saint-Maurice Ironworks which was described as a pit lined with a wooden box.[21]

On the other hand, the *Dictionnaire des jardiniers* (1785), a translation of the 1768 edition of *The Gardener's Dictionary*, recommends that the pits should be lined with brick.[22] This style seems to have been popular in Virginia where, in the 18th century, pits faced with brick replaced most of the older icehouses that had been built with bare clay walls.[23]

The *Encyclopédie* of Diderot and D'Alembert recommends the use of stone to line the walls of the excavation, unless wood was preferred, or the ground was very firm. The icehouse in the Fortress of Louisbourg, like those in Metz, in the French mother country, were built in this fashion during the first half of the 18th century.[24] But stone also had its followers among the Anglo-Saxons; thus, the reservoir of the icehouse owned by the United States Superintendent of Finance, Robert Morris, in Philadelphia, in 1784, had a masonry lining.[25] At the Château Saint-Louis in Québec, the icehouse built in 1771 for the Governor was partly excavated into the rock, but the mason John Bell nevertheless dressed the walls of the pit with a stone and mortar facing that was over 1.5 metres thick at the top[26] (Fig. 2.3). Roughly cut blocks and chunks of limestone, shale, and sometimes sandstone, made up the rather irregular courses of the structure brought to light by the archaeologists.



2.4 On this engraving drawn from the *Histoire de l'Amérique septentrionale* of Bacqueville de la Potherie, the icehouse is the only construction in the southeast courtyard of the Château.
(Québec [circa 1700]; National Archives of Canada: C-4696, detail)



2.3 The icehouse found under the Dufferin Terrace, during the course of the excavation. (Canadian Parks Service, photo: Michel Élie; 38G85R103X-11)

Carefully dressed stones were also found, especially on the east side, the inside and outside wall facings, and in the southeast corner of the reservoir. They may have been used to replace broken or crumbling blocks during the course of repairs like those carried out in 1781, both to the wall of the old battery and to the icehouse.[27] In its 1846 edition, Loudon's *An Encyclopaedia of Gardening*, which was published in London, once again recommended the use of stone as facing for the pit.[28]

A Little Geometry

In other respects, the pit could take the shape of an inverted truncated cone which would make it easier to excavate and reduce the risk of cave-ins. Many icehouses from Italian constructions of the 17th century to Loudon's proposal in the middle of the 19th century, adopted this model. The Louisbourg icehouse was no exception.[29]

Often, the supporters of the inverted truncated cone recommend that the depth of the pit should be at least equal to or longer than its largest diameter (Table 1). The icehouse in the Fortress of Louisbourg was not built to this profile. Its proportions are closer to those proposed by Bélidor in the 1729 edition of *La Science des Ingénieurs [...]*, which recommended that the depth should be more or less equal to the radius of the circumference. In his opinion, the ground should follow its natural slope, and would consequently hold up at an angle of 45 degrees.[30]

The cylindrical shape has an advantage over the cone in that it makes it possible to store a greater quantity of ice for the same exposed area. It is likely that this was the shape preferred by Philip Miller in *The Gardener's Dictionary*. It was also used in Monticello in 1802, by the President of the United States, Thomas Jefferson.[31] According to Miller, the diameter and depth should be identical to those suggested by Loudon for a pit in the shape of a truncated cone; namely, a depth equal to or longer than the diameter at the top. Even though it was much larger than those discussed by Miller, the dimensions of Jefferson's icehouse pit were consistent with the proportions recommended in *The Gardener's Dictionary*.

Pits with square or rectangular sections also had their supporters. However, we should not take it for granted that the squares and rectangles identified as icehouses on the old plans of large Québec properties, such as the Hôtel-Dieu, Spencer Wood, and Woodfield in Québec, or even in the Mother House of the Notre-Dame congregation, and the Sulpician Seminary in Montréal, necessarily represent the actual shape of the ice pits.[32] They could also reflect the configuration of the buildings on top. On the other hand, the French icehouse unearthed in the Saint-Maurice Ironworks is truly representative of this category. The underground box has a rectangular section and vertical walls, and the depth of the pit is smaller than its horizontal dimensions.[33]

Thomas Moore believed that the ideal icehouse assumed the shape of an inverted truncated pyramid with a square section. Once faced, this ice chamber framed by "perpendicular" posts may not have retained the same configuration.[34] It could end up in the shape of a cube, as was the case with the plans for an icehouse proposed in *The American Museum, or, Universal Magazine [...]*, in September 1792. Even though the pit was sixteen feet per side at the top and twelve feet per side at the bottom, the inside of the ice reservoir, bordered by a wall of logs, measured only nine feet per side from top to bottom. This American periodical also described another icehouse where the underground reservoir had the shape of a truncated inverted pyramid with a square base. This structure, which was seen in the Chesapeake Peninsula, is deeper than it is wide.[35]

We do not know the shape of the ice chamber in the icehouse built near the Québec residence of the French Governor.[36] On the other hand, the masonry-lined pit dating from the British occupation has been studied by archaeologists. In the general shape of an inverted truncated pyramid with a rectangular section, it is nevertheless characterized by slightly arched flanks (Fig. 2.11). The slope of the walls is not the same from the bottom to the top of the reservoir. The four walls slope by about 45° in the bottom, and then straighten gently so that the tops of the north and south sides only slope by about 35°, and those of the east and west sides are only about 20° short of the vertical.

The construction found under the Dufferin Terrace shows a configuration that is similar to that of the pyramidal reservoir depicted in *The American Museum*. However, contrary to the latter, the depth is shorter than its horizontal dimensions. The "funnel" shape and proportions of the underground section of the Québec icehouse are also reminiscent of the

icehouse excavated in Louisbourg, and even more of that described by Bélidor. Could these similarities have been the result of a certain French military tradition and inherited from the old icehouse, or were they passed on through books or the men responsible for building them? Unquestionably, the fact that the pit of the English icehouse was excavated into the rock could also explain its configuration.

SIZES AND ICE STORAGE CAPACITY OF SOME UNDERGROUND ICEHOUSES

CIRCULAR SECTION RESERVOIRS	Diameter		Depth	Capacity
	Top	Bottom		
INVERTED TRUNCATED CONE				
Italian icehouses (R. Boyle, 1683)	25 ft/7.62 m	–	47 ft/14.33 m	–
Louisbourg (1725)	14.66 ft/4.47 m	10.12 ft/3.08 m	8.73 ft/2.66 m	32.65 m³
Bélidor (1729)	16 Fft/5.2 m	3 Fft/0.97 m	6.5 Fft/2.11 m 7.7 Fft/2.5 m	18.25 m³ 21.62m³
Diderot and D'Alembert (Paris, 1757)	2 or 2.5 fathoms/ 3.9 or 4.87 m	–	about 3 fathoms/ c. 5.85 m	–
A. Ure (New York, 1845)	16 ft/4.88 m	–	24 ft/7.32 m	–
Loudon (London, 1846) small icehouse large icehouse	6 ft/1.83 m 9 or 10 ft/ 2.74 or 3.05 m	– –	8 ft/2.44 m 9 or 10 ft	– –
CYLINDRICAL				
Miller (England, 1768-1785) small icehouse large icehouse	6 ft/1.83 m 9 or 10 ft/ 2.74 or 3.05 m	6 ft 9 or 10 ft	8 ft/2.44 m 9 or 10 ft	6.41m³ 16.21 or 22.24 m³
Thomas Jefferson (Monticello, 1802)	16 ft/4.88 m	16 ft	16 ft	91.1 m³
QUADRANGULAR SECTION RESERVOIRS	**Horizontal dimensions**		**Depth**	**Capacity**
	Top	Bottom		
RECTANGLE				
Saint-Maurice Ironworks (1740)	9.3 x 11.3 ft/ 2.83 x 3.44 m	9.3 x 11.3 ft	8.55 ft/2.6 m	25.44 m³
R. Morris (Philadelphia, 1784)	16 ft/4.88 m	16 ft	16 ft	115.99 m³
The American Museum (Maryland, 1792)	9 ft/2.74 m	9 ft	9 ft	20.64 m³
T. Moore (1803)	8 ft/2.44 m	8 ft	7ft/2.13 m or 8 ft	12.69 or 14.5 m³
TRUNCATED PYRAMID				
Dufferin Terrace (1771)	**6 x 4.65 m**	**2.65 x 2.15 m**	**1.92 m**	**29.57 m³**
The American Museum (The Chesapeake, 1792)	8.5 ft/2.59 m	6.5 ft/1.98 m	9 ft/2.74 m	14.42 m³

table 1

The Capacity of the Reservoir

The dimensions of the pit should be proportional to the quantity of ice to be stored. However, several encyclopedias mention that the larger the ice chamber, the more likely that the ice would last a long time, since the stored ice itself would provide a source of cold.[37] In 1792, an American from Maryland thought that about 28 cubic metres of ice was not quite enough to ensure that the ice would last throughout the entire hot season. On the other hand, in the *Traité d'architecture rurale*, published in Paris in 1810, Mr. de Perthuis estimated that the minimum capacity of an ordinary icehouse should be 39.6 cubic metres, in order to keep the ice properly.[38] Larger icehouses also have other advantages. In fact, a small expansion in surface area corresponds to a large increase in storage volume which would proportionally allow significant savings in the construction.[39] Moreover, a large icehouse makes it possible to store the amount of ice required for more than one year, and would consequently offer some protection against any eventual shortages, if the subsequent winter were too mild.[40]

The top of the ice chamber formed by the masonry facings of the icehouse uncovered in the southeast bastion of Fort Saint-Louis measures about 6 metres in length by 4.65 metres in width. The ice chamber is 1.92 metres deep, with horizontal dimensions dropping to 2.65 by 2.15 metres at the level of the floor used to hold the ice. Thus, it could hold over 29 cubic metres of ice which is a little more than at the Master's house in the Saint-Maurice Ironworks, and a little less than at the Fortress of Louisbourg (Table 1). Robert Morris and Thomas Jefferson were able to store much more, but they may have had to compensate for losses due to the warmer climate. In fact, our long cold winters, the long periods when the Governor and his family were out of town during the summer, and the ease with which provisions could be obtained as a result of the urban location of the Château Saint-Louis may certainly explain different needs.

2.5 An addition was built between the icehouse and the curtain wall.
(*Plan de Québec [...] En l'année 1702*; National Archives of Canada; C-15788, detail)

Two Sworn Enemies: Humidity and Heat

While greenhouses thrive on humidity and heat, an icehouse must unrelentingly struggle against the same elements. Its weapons are a dry location, an efficient drainage system, and proper insulation.

Keeping the Body Dry and the Nose to the Wind

All authors agree that the first condition that must be met when building a good underground icehouse is to locate it in a dry spot. For Andrew Ure, editor of *A Dictionary of Arts, Manufactures and Mines [...]*, this means that the soil itself must be sandy and dry. If the ground is heavy, clayey, and wet, according to Philip Miller, it would be better to build the ice chamber above the surface of the ground. This method to avoid humidity was widely used in North America during the 19th century, particularly in rural areas.[41]

In the case of underground ice storerooms, care must also be taken regarding any groundwater and subterranean trickles.[42] Thus, it is always preferable to choose an elevated location, which will, among other things, allow all surrounding water to drain away.[43] In Québec, the small La Glacière fort was placed by Levasseur de Neré in 1697 on the heights of "cap aux Diamants." The engineer subsequently erected on the same location where the Citadel rises today, the La Glacière bastion.[44] In 1729, Bélidor would suggest that the icehouse for the use of the officers in a fortress should be enclosed in a solid bastion.[45] Other authors, more interested in civil architecture, would propose placing the structure against the sides of a hill, near the

top.[46] Despite the slight variations in its location shown on the old plans, the icehouse in the Château Saint-Louis remained enshrined in the slope which drops toward the cliff overhanging the lower town.

Miller insisted that an icehouse must be exposed to the sun and air so that any humidity could be controlled more easily. In his opinion, it would be unthinkable to conceal it under the shade of trees as recommended by Bélidor.[47] He would undoubtedly have disapproved of George Washington's idea of planting ivy around his icehouse in Mount Vernon.[48] At the Château Saint-Louis, the French icehouse was placed in a very open spot, away from the smallest hint of a shadow, before an addition was built against the south side in 1702 (Figs. 2.4 and 2.5). On the other hand, a wood shed and a stable, and later a greenhouse with an attached lean-to were built around the British icehouse, allowing only the east wind and the morning sun to reach it with their gentle drying touch (Fig. 2.6).

In other respects, the waterproof properties of the chosen location could be improved by a few rather simple measures. Bélidor recommended that the masonry should be allowed to dry thoroughly before building the roof of the icehouse.[49] According to Moore, the best way to protect an icehouse against rain and to allow the free circulation of air, would be to build a thatched roof supported by posts a few feet from the ground.[50] Moreover, all icehouse owners were strongly encouraged to dig a drainage channel around the building to collect any surface water that would otherwise tend to leak into the structure.[51] In 1818, the roofer Jacques Feluet built a metal and shingle duct between a wooden building and the Château Saint-Louis icehouse.[52] This may have been done to protect the icehouse from water dripping from the roof of one of the three adjacent structures.

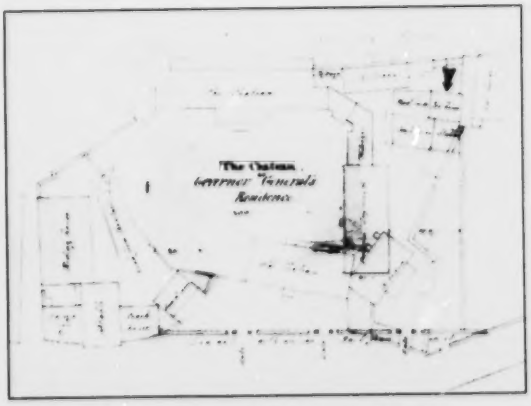
Beware of Any "Hot" Baths or Air Drafts!

Inside the ice chamber, water from melting ice must not be allowed to come in contact with the remaining ice, since this would lead to further melting.[53] Therefore, a way had to be found to prevent any dripping, or at least to keep it from wearing away the ice. Diderot proposed two solutions: to build a dead well two feet wide by four feet deep at the bottom of the pit and to place the ice on a grating attached to the top of this well; or to build a floor, about three feet from the bottom of the pit, under which the water could drain.

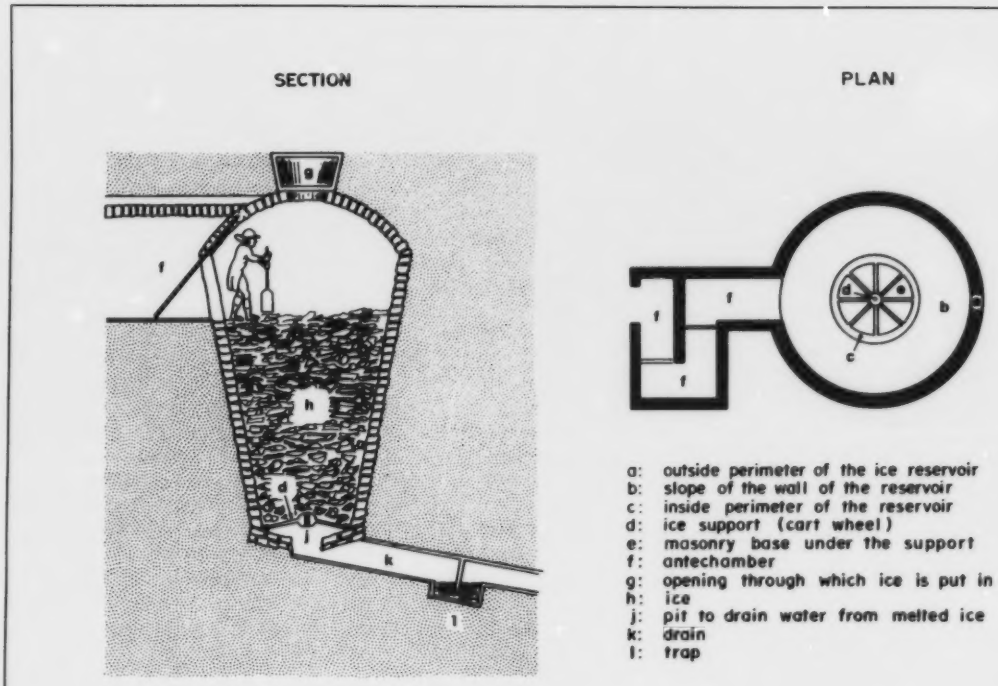
The first method was used in various places, including Louisbourg and Metz, and was recommended by Bélidor, although the dimensions were different. In fact, the size could vary depending, for example, upon the nature of the surrounding soil, the proximity of groundwater, or even the elevation and capacity of the icehouse.[54] This style of construction was popular for a long time, since it was still recommended in the 1845 edition of *A Dictionary of Arts [...]*.

The solutions advanced by Morris, Moore, and Loudon are quite similar to Diderot's second proposal. The flooring of the ice storeroom described by Robert Morris consists of an openwork platform made of cross-beams laid on top of wooden blocks, about two feet above a layer of coarse gravel at the bottom of the pit.[55] Instead of being permeable, the bottom could also have been faced with masonry, sloped into a drain and covered with cement.[56] On the other hand, Thomas Moore suggested the use of a sloped watertight floor with a drain at its lowest point. Planks assembled by tongue and groove or nailed to struts were attached to sleepers about a foot above the bottom of the trench which had been previously lined with dry sand. Finally, Moore recommends that a few pieces of wood be placed over this floor in order to support the ice. As far as the drainage pipe is concerned, it would slope away from the pit over most of its length. The outer end should be bent in order to form a trap that would be always full of water, so as to prevent any exchanges with the outside air. If there is not enough slope to be able to dig a drain easily starting at the bottom of the storeroom, Moore suggests that the icehouse should be built in a mound of earth, entirely above the surface of the ground.[57]

In the ice chamber proposed by Loudon, a solid grating or old cart wheel was used as flooring, and



2.6 The icehouse is almost entirely surrounded by other outbuildings.
(H. Pooley, 1827; National Archives of Canada; NMC-21206, detail)


SECTION
PLAN
a: outside perimeter of the ice reservoir
b: slope of the wall of the reservoir
c: inside perimeter of the reservoir
d: ice support (cart wheel)
e: masonry base under the support
f: antechamber
g: opening through which ice is put in
h: ice
j: pit to drain water from melted ice
k: drain
l: trap

2.7 The underground icehouse in the shape of an inverted truncated cone.
(Drawing made on the basis of similar illustrations published in J.C. Loudon, *loc. cit.*, Fig. 618, and the *Encyclopaedia: or, Dictionary of Arts, Sciences [...]* [Philadelphia, 1798], Vol. IX, plate CCL; Canadian Parks Service, drawing: François Pellerin; 88-38G-D6)

installed two feet above the bottom. From there, the water could run outside through a small underground channel equipped with some sort of air trap to prevent the air from getting in (Fig. 2.7). Loudon explains that some people stored ice on a heavy grating installed over a grooved floor connected to a watertight well built into the passage leading to the icehouse. The collector well could be emptied as needed, using a container, without having to enter the ice chamber itself. This may have been the system used at Monticello since, in February 1806, Thomas Jefferson had to ask one of his employees to make sure that the water was drawn out of the icehouse once or twice a week, or as often as necessary.[58]

Very often, according to Loudon, one's confidence was put in the coolness of the site, particularly if the surrounding ground was dry. Must we conclude that, in 1846, many icehouses did not yet have any particular drainage system? In the colony, an icehouse built in Montréal at the beginning of the 18th century would be equipped with a grating to drain the water dripping from the ice.[59] Also in Montréal, a duct was built in 1785 to drain dripping water from the ice supply kept by the Hôpital Général.[60] In the capital, the icehouse built by the Hôtel-Dieu in 1735 was also drained by a duct.[61] It is not certain, however, that this was the general norm, particularly in the country.

At the Québec residence of the Governor, a duct was used to drain the icehouse as early as 1692. It started on the east side and dropped in a straight line toward the edge of the cliff (Fig. 2.1). On the other hand, the underground drain that started in the east side of the wall of the British ice reservoir ran down the slope in a zigzag path (Fig. 2.8). Water from melting ice dripped into the channel along well-jointed vertical masonry walls about 27 centimetres high. The channel had a covering of pine boards and a floor of stones and mortar 15 to 29 centimetres wide. Its slope was a little over five degrees. Through its tortuous path to the outside of the reservoir, the liquid does not seem to have met with any obstacles such as a trap, that would have made it possible to cut off contact with the outside air. It is nevertheless possible that some type of stopper, like that described by Loudon, was placed under the east wall of the reservoir, in a site inaccessible to archaeological exploration. But it would not have been surprising if in

those earlier times the zigzag path alone would have been used to fight, in its own rudimentary way, any air circulation. In this respect, the channel seems to start zigzagging under the eastern wall: it cuts through the inside facing of this wall in the middle of its length but, on the outside, it emerges from the facing near the south end of the bottom of the reservoir.

The ice was laid on an openwork floor made of ten parallel oak beams over 20 centimetres per side (Fig. 2.9). The ends of the platform were embedded under the base of the sloping side walls of the reservoir, about 15 to 20 centimetres from the bottom of the pit. The 3 to 5 centimetre gaps between the timbers allowed the water to drain to the bottom, where a watertight mortar layer prevented it from filtering into the cracks in the rock. The water ran into the mouth of the drain which was opened on the side of the pit, between the bottom and the underside of the beams (Fig. 2.10).

Wrapped from Top to Bottom

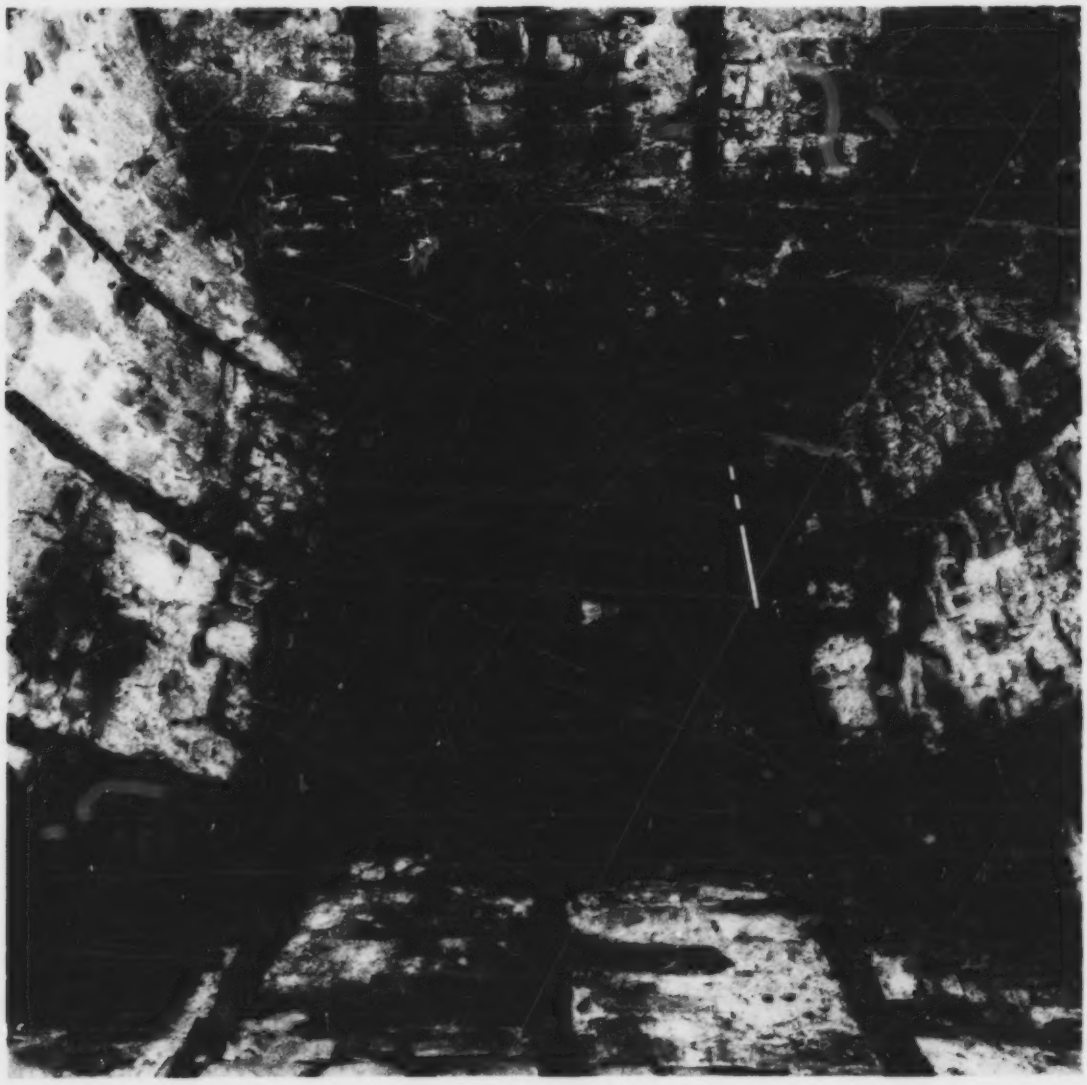
In order to keep ice for a long time, the icehouse must be well insulated. The walls must be water and air-tight. When the walls of the ice chamber are made of bare clay, for example, it is always necessary to

2.8 The zigzag path of the icehouse drain. (Canadian Parks Service, photo: Michel Élie: 38G86R125X-5)

cover the sides with straw.[62] This precaution must be taken in order to prevent freezing from damaging the walls of the pit, and the heat of the ground from melting the ice.

If the reservoir of the icehouse was made of wood, the walls could rest against the earth walls of the pit, which they helped to support, or they could be placed some distance away from them. In the first case, the posts of the framework were often covered on one side and the other with planks assembled by tongue and groove or nailed to struts. The space between the inside and outside walls was then filled with reeds, straw, sawdust, peat, or other kinds of materials with poor conduction characteristics.[63] The icehouse unearthed in the Saint-Maurice Ironworks probably belongs to this category.[64] In the second case, Thomas Moore suggested that only the inside of the wood posts should be covered with lap-jointed planks, to prevent the water from running outside. At the beginning of the winter, clean dry straw should be stuffed in the space between the wood facing and the natural walls of the pit. In this way, according to Moore, the latter would be protected from any deterioration caused by freezing.[65]

Finally, according to Miller, when masonry was used, it should be quite thick and, according to Diderot, well coated with mortar. In *A Dictionary of Arts [...]*, Ure specifies that Roman cement should be used. The stones were held by mortar only in the upper part of the reservoir built by the American



2.9 The platform used to support the ice. (Canadian Parks Service, photo: Michel Élie; 38G86R47X-4)

Morris, while the rest was built with dry masonry. On the other hand, in the icehouse discovered near the Château Saint-Louis, all the joints were filled with mortar, and even the facings had been covered with rough plaster. Despite such precautions, stone itself was a problem. In fact, as Pehr Kalm accurately reported, it "attacks the ice."[66] Apart from oozing with condensation, it offers no resistance to heat.

Layers of air trapped in the masonry would provide the walls of the storeroom with an insulating value that is proportional to their thickness. Whether this measure is used or not, stone walls must be kept separate from the ice, using a less conductive material such as wood, straw, reeds, sawdust, moss, coal, or even better, a combination of these.[67] This is why, according to Pehr Kalm, the ice cellars in the Québec region had to be lined with wood.[68]

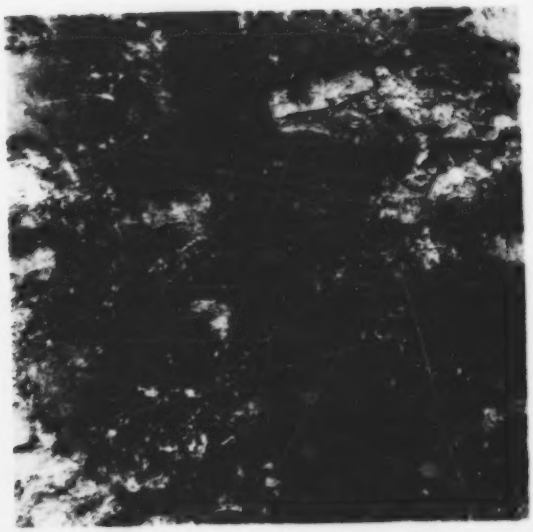
The wood lining could be placed directly against the masonry in the ice chamber. This was the case in a Berlin icehouse where the inside walls made of baked bricks were covered with narrow planks set about one inch apart. In another German icehouse, thin sticks covered with straw and arranged one against the other, were used to cover the rubble walls. The wood lining and the masonry walls could be separated by a space where a poor conductor, such as straw, could be inserted.[69]

Pine was used to insulate the walls of the reservoir unearthed under the Dufferin Terrace. The horizontal planks were nailed side to side over perpendicular timbers embedded in three parallel grooves cut into each of the flanks and following their respective curvatures (Figs. 2.11 and 2.12). The timbers were attached, using forged nails, to a horizontal piece of wood at the back that was set into the masonry during the construction of the pit lining. In the east and west facings, the lower ends rested partly on the first beam of the ice support to which they were attached by two forged nails. On these facings, the tops were not held by a closed groove, as in the north and south ones. The insulating boards found by the archaeologists rested against the masonry. However, a thin layer of wheat straw, remains of which were found at the bottom of the north wall, may have originally been inserted between the masonry walls and the wood facing.

When the inside of the masonry ice chamber was not lined with wood, as in the case of Louisbourg and the icehouse built by Robert Morris in Philadelphia, it was imperative to place another non-conductive material between the ice and the wall at the time the ice was put in. Most often, the use of dry straw was recommended.[70]

The bottom of the ice storeroom must also be carefully insulated. Diderot recommended that the grating or openwork flooring should be covered with

2.10 Beam used to support the ice, embedded into the masonry under the east wall of the reservoir, above the mouth of the drain.
(Canadian Parks Service, photo: Michel Élie; 38G86R73X-11)

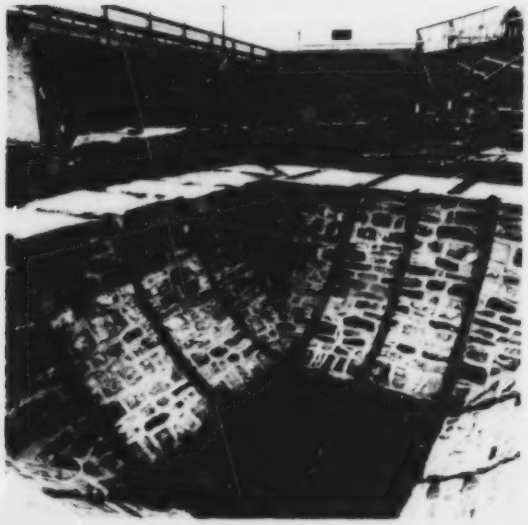


2.12 The forged nails used to attach the wooden facing were still visible.
(Canadian Parks Service, photo: Michel Élie; 38G86R32X-8)

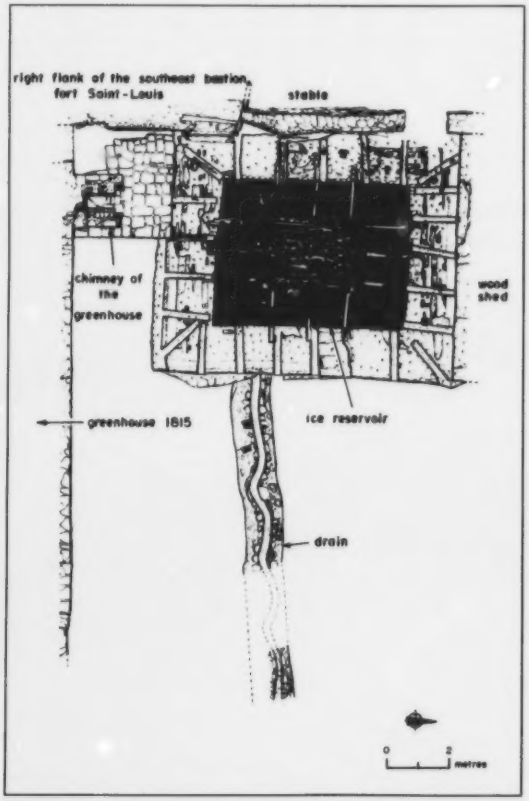
a layer of straw, before the ice was stored. Wheat stalks, remains of which were found in the icehouse at the Château Saint-Louis, may have been used for this purpose. On the other hand, Miller and Loudon recommend that a few branches of dry wood should be placed over the ice support, and that a layer of reeds, which are better for this purpose than the more commonly used straw, should be spread above it. The plan proposed by Moore allows for the use of poor conductors such as ash, sawdust, or straw between the bottom of the pit and the floor, as long as the latter had been made perfectly watertight.[71]

Alexander gave orders to cover his icehouses with twigs and leaves. Showing evidence of the same sound judgment, the Italians of the 17th and 18th centuries covered theirs with a good layer of thatch. The model proposed by Diderot is very similar to the Italian snow pits described by Robert Boyle in 1683. A pyramidal framework placed above the pit was carefully covered with straw without leaving any openings so that the lower layers came down to ground level. In this roof, the Italians opened a narrow door lined with thatch. Diderot added to the north side of the icehouse a narrow passage tightly closed by a door at both ends. It goes without saying that the first door had to be closed before the second was opened, thereby preventing outside heat from penetrating into the icehouse in the summer. Finally, like the Italians, Diderot chose to insulate the ice by covering it directly with a layer of straw. Moreover, he suggested that wooden planks secured with large stones should be placed over the straw, in order to keep everything well compacted.[72]

Almost one hundred years later, *A Dictionary of Arts [...]* described almost exactly the same method proposed by Diderot. Only the shape of the roof had changed, assuming the outline of a cone.[73] In the meantime, Thomas Moore expressed his preference for thatch, not only because it was effective against humidity, but mainly because it could protect the contents of the icehouse from the direct rays of the sun. As we have seen, his roof stopped a few feet from the surface of the ground, allowing for proper ventilation. However, for all this, the air could not reach the ice, since Moore recommended that the latter should be blanketed with a thick layer of straw or, even better, that the ice chamber should be covered over with planks, leaving only one door to go down inside.[74]



2.11 Three timbers were embedded into each of the bowed walls to hold the planks of the wooden facing.
(Canadian Parks Service, photo: Michel Élie; 38G86R135X-4)



2.14 At the top of the masonry walls of the reservoir were found remains of the walls and floor of the cold chamber. The darker parts correspond to the bowed walls of the reservoir. In the centre of the rectangle, appear the wooden beams that were used to support the ice.
(Canadian Parks Service, drawing: François Pellerin; 88-38G-D5)

As far as Philip Miller was concerned, he proposed, in 1785, that the icehouse should be topped by a single or double vault protected by a roof covered with slate or tile. The vault would start at the top of the walls of the ice chamber, three feet above the surface of the ground. The roof would sit on an exterior wall that could be either circular, square, or with six or eight corners and raised just to the level of the vault or higher if necessary, so that a door could be built. To prevent sun and air from getting inside, a bed of reeds two feet thick, topped by a layer of mortar mixed with hair, would be laid over the roof before the covering was installed. The opening used to fill the icehouse could be protected with a closely fitting stone. Barley straw would be used to insulate the external door installed in the north side. At the same time, the door used to take out the ice should be protected from the outside heat by an antechamber.

Loudon's *Encyclopedia* introduces several variations on this theme. First, the two proposed vaults are separated by an air space. Next, the ice is put in through an opening placed at the top of the arch. The precious substance is removed through three swinging or sliding, rather than hinged, doors. One only has to remove the straw filling the two enclosed

2.13 The Château icehouse as it appears on the Duberger model, 1801-1808.
(Canadian Parks Service, photo: Jean Audet; 100/MD/PR-6/S-26-8)

porches in order to take out the ice. It is important to point out that this measure is even more effective when the passage zigzags, and when the chamber is entered only early in the morning or late in the day. Instead of being topped by a roof resting on an external wall, the vaulted chamber is covered with a layer of thin clay, and then with an earth mound that also covers the entry passage.

What methods were used to enclose underground constructions topped by a room on the ground floor? The Louisbourg icehouse was successively topped with a square gabled roof, a gabled roof with six or seven sides, and a conical roof. The second, which was built before 1730, was made of a pine framework covered with shingles. It rested on a masonry wall about six feet high, built over a foundation attached to the top of the inverted cone forming the ice reservoir. This footing may also have been used to support the ground floor platform, which was possibly equipped with a trap door. At the entrance to the building, the presence of an antechamber with the outside door oriented to the north, reveals the care from the heat. There is no proof that the walls were covered with earth, as in the case of an icehouse in Metz; nor that shrubs were used to shade the construction from the sun's rays, as counselled by Bélidor.[75]

Robert Morris also taught George Washington other tricks, derived from his own experience, that could be used to properly seal an icehouse of this type. After raising the wall of the ice chamber to ground level, Morris built a foundation two feet deep and two feet outside the wall, surrounding it completely. Over this base, he placed thick stone and mortar walls about ten feet high, and covered the outside face with plaster. Once the roof was installed, a horizontal plank ceiling was nailed in, and the space between the two was stuffed with straw. To this point, Morris's measures were similar to those recommended by Miller; however, contrary to the latter, Morris, who needed a floor at ground level, used it to improve the insulation of the ice chamber. Under the floor joists, which rested on the top of the reservoir, he installed a ceiling, and stuffed the space between the two with straw. A trap door was opened in the middle of the floor to give access to the ice in the storeroom. Finally, according to the rules of the art, the door of the building was oriented toward the north.[76] Eventually, Washington would build his own icehouse which, in late autumn of 1785, he covered with dirt and sod.[77]

The small square building representing the icehouse at the Château Saint-Louis on plans drawn around 1692 could have been covered with a pavilion roof (Fig. 2.1). At the beginning of the 18th century, an addition was added to the south side; thereafter, the drawings show that the two constructions shared a single ridge roof. It seems that the roof was covered with shingles. When it was refurbished in 1730, the surface area was estimated to be ten fathoms. The east wall of the rectangular construction had two openings, one of which resembled a vault. The north wall was blind and may have been protected by a fire barrier (battlements). We know that the building had a floor containing a trap door and windows that could be closed with shutters, since, in 1733, the records show that these had been repaired at the same time as the doors.[78]

The archaeological excavations revealed only a few traces of the superstructure of the British Governor's icehouse. On the one hand, remains of pine beams measuring about 30 centimetres thick which were embedded in the mortar around the top of the ice reservoir, suggest log construction. Taking into account the type and thickness of the wood used, we may estimate that the resistance of the walls to heat would be equivalent to RSI 2.65 (R 15).[79] Estimating on the basis of the remains, the external dimensions of the building were 9.10 metres by about 7.60 metres. The numerous fragments of metal recovered in the demolition debris indicate that, at least in its last version, the icehouse was covered by a metal roof in the "Canadian" style. However, the debris could also have come from neighbouring outbuildings destroyed at the same time as the icehouse, in 1854.

According to the written documentation, 354 feet of timber and 128 boards were bought in 1771, to be used "in the Roof framing and Beams [...]" and "in the double Covering [...]"[80] respectively. Does this mean that the wooden framework of the roof was then covered with a double layer of the same material? It is difficult to be sure, because it could also have been used for the double facing of the ice-pit, for which no other sum is recorded in the account books. It seems that soon after the icehouse was built, the level of the ground around it was raised and covered with sod.[81] In 1773, soil was again brought in "for the Ice-house, Covering and Planking it round to prevent Cattle going on it."[82] The three-dimensional Duberger model probably is indicative of landscaping around the building, when it shows the roof reaching very close to the surface of the ground (Fig. 2.13).

From the expenses incurred in 1771, we can conclude that the ice cellar was covered with a floor equipped with a hinged trap door.[83] The traces uncovered at the top of the facing of the masonry walls of the reservoir seem to indicate a very different type of construction (Fig. 2.14). Unevenly spaced

horizontal grooves were found perpendicularly to the direction of the walls. Most of them were closed at the end facing the inside of the reservoir, so that the joists embedded there could not extend regularly above it. The pine floor planks were attached by forged nails to the cedar joists which, in most cases, could not be more than 1.5 metres long. They could cover only the top of the walls of the reservoir, going around the pit in the same direction as the walls (Fig. 2.15).

This kind of floor could not have helped to insulate the ice kept underneath in the upper part of the reservoir. Taking into account the distribution of the open grooves, it would probably have been possible to install a complex infrastructure that could hold a floor above the reservoir, by crisscrossing longer joists. However, no material remains have been found that could support the hypothesis formulating such an arrangement in the last state of the icehouse. As for the remains from the occupation of the cold chamber, they were found mainly on the floor that surrounded the reservoir, and not in the debris that fell in during the demolition.

The purchase of two double shutters when the icehouse was constructed seems to indicate the presence of windows; however, they are not shown in the Duberger model, and archaeological research has been unable to confirm their presence. It appears that the cold chamber was closed using a double door.[84] In 1772, a porch made of 108 feet of timber and 50 boards was added, and insulated by covering it with soil.[85] This could not have been built on the north side, where the wood shed was located or, on the west side, where the stables were. No archaeological remains have made it possible to locate it on the east side. If it was, in fact, placed there, it may have been demolished, or entirely removed during the course of large scale renovations, like those carried out in 1778. That year, the 354 feet of original timber were replaced, and 112 new boards were used for the covering.[86] On the Duberger model, the front wall of the east side is almost completely hidden with earth. Only the south side, so unsuitable for an opening, remains; here again, no traces have been found. Nevertheless, it is still possible that the mysterious porch was built against the right flank of the south-east bastion of the fort, in the place where the pavement surrounding one of the 1815 greenhouse chimneys was found (Fig. 2.14). This would explain why the archaeologists were unable to find the foundations, and the fact that the icehouse has such a rectangular shape on the Duberger model.

2.15 Remains of the floor of the cold chamber.
(Canadian Parks Service, photo: Michel Élie; 38G85R51X-10)

What to Use, Snow or Ice?

Diderot said that snow is in great demand in hot countries. Maybe it was more common and easier to collect than the ice that formed on lakes and rivers. In Québec, until the middle of the 18th century, the custom seemed to be to use snow. According to Robert-Lionel Séguin, river ice was not commonly collected before that time.[87] Those who wrote about icehouses do not seem to agree about what would be the best material to store in these facilities.[88] What are the advantages of one over the other? Abundance and ease of handling are certainly important choice elements. It is also necessary to take into account the "shelf life" of these two forms of frozen water. On 2 June 1784, George Washington asked his friend Morris whether it was because he had filled his icehouse with snow rather than ice that he had found himself so soon left in the lurch! Morris replied to the first American President that, one year, the snow

stored in his Philadelphia icehouse was lost in June, while another year the ice had lasted until the fall.[89]

It may be that the two statesmen did not know anything about the particular care that must be taken to store snow over a long period of time. Diderot thought that, if it was collected in dry weather and compacted as much as possible into the icehouse without leaving any gaps, snow would last as long as ice. In very cold weather, the snow should also be sprinkled with a little water, in order to compact it. Almost one hundred years later, *A Dictionary of Arts [...]* shares the same convictions and recommends the same methods. Without taking sides, Loudon, in *An Encyclopaedia of Gardening*, emphasizes the need to exclude air from the snow and work it in such a way that it approaches the texture of ice.

Ice storage also requires certain precautions. As in the case of snow, one should choose, as much as possible, a day that is cold and dry and leave the doors and trap doors wide open, so that the icehouse itself is very cold.[90] According to Moore, after collecting the ice, it should be exposed to the cold air for at least one night. If the outside temperature is very cold, the temperature of the ice will drop several degrees.[91]

Should we, like Diderot, choose the largest and thickest pieces of ice or, like Miller and Loudon, prefer thin ice that is easier to break up? Indeed, it is necessary to crumble the frozen substance, and to crush it into fine particles "not larger than those of sand or salt," before storing it in the ice reservoir.[92] In order to carry out this operation, one could use a mallet, a club, or a stick. The finer the fragments, the easier it will subsequently be to pack them tightly.

Inside the reservoir, the ice is again beaten with a large mallet, axe head, or rammer, and occasionally sprinkled with a little water. This is done in order to eliminate any gaps in the ice, so that, as everything freezes, it becomes a solid mass that must be broken with a chisel or axe when one wants to remove a chunk. This is how it is possible to keep ice over a long period of time.[93]

Unfortunately, we do not know what raw material was used to fill the ice reservoir at the Château Saint-Louis. In the *capitale de la neige* supply was not a problem: snow fell in great quantities, and the ice that formed on the St. Lawrence and St. Charles rivers was there for the taking (Fig. 2.16).

2.16 Ice cutters on the St. Charles River.

(Jas. P. Cockburn, "Cutting Ice in Winter at Quebec for Summer"; National Archives of Canada, C-40342)

To Use or Not to Use Additives?

Layering the contents of the storeroom by alternating slabs of ice and beds of straw was out of the question as this would result in a porous mass.[94] Rather, Miller's *The Gardener's Dictionary* recommends the use of a little saltpetre spread between each ten to twelve inches of ice, in order to pack everything tightly together. Loudon also believed in the virtues of using salt. He recommended that it should be mixed with the sprinkling water in a proportion of ten pounds of salt for every ten gallons of water, and that enough of this solution should be poured on the ice, when filling the reservoir, to saturate it completely. He said, the ice would become as hard as rock, and last three times longer than if pure water had been used. It would also be less vulnerable when exposed to the air. Loudon explains this phenomenon saying that the heat absorption capacity of salted water, and consequently of salted ice, is lower than that of water or ice to which nothing has been added.

Paid for in Coin and in Kind

In Thomas Jefferson's home, in Monticello, it was the manager of the property who was in charge of filling the icehouse. This operation took place between the end of December and the beginning of March, most often in January. In 1803, sixty-two cartloads of ice were required to fill the reservoir. The President paid $70 to cover all expenses, including the men's work, as well as the cost of their food and drink.[95]

In *An Encyclopaedia of Gardening*, Loudon emphasizes that, for a long time, the custom was to put the gardener in charge of the collection, storage, and conservation of the ice. It is unclear whether or not the first two activities, at least, were always under the responsibility of the same person, in an urban setting like Québec City.[96] The documentation is very discreet on this question. The "Bordereau de la dépense faite en Canada pendant l'année 1740 [...]" mentions only the fact that various carters and journeymen were paid 102 pounds for filling the Château icehouse.[97] The account books of the Hôtel-Dieu make no mention of the person or persons responsible for these operations, who were very probably part of the household. They do not mention ice cutters either. This may have been because this task was carried out by domestic servants, or because the cost of the work was included in the sums paid for extra help to prepare the icehouse[98] and to several carters for trips to the lower town,[99] to fill the icehouse.

From 1826 onward, the hospital paid carters for many snow trips. In the account books, there are no longer any mentions of filling the icehouse, despite the significant renovations that were made to the structure. We may wonder whether the snow cart mentioned is evidence of work carried out to stock the ice reservoir.[100] On the other hand, the activity of the carters may have simply reflected the removal of snow from the property. Is it possible that the seven or eight additional ice trips paid for each year between 1848 and 1851 were related to the work of filling the reservoir? Unfortunately, the treasurer of the hospital does not say.[101] Also, the responsibility for collecting the ice remained unspecified. As far as the time when this activity took place is concerned, according to Robert-Lionel Séguin, it was generally carried out between mid February and the beginning of March.[102]

Exceptionally, the administrator of the Hôtel-Dieu Hospital in Québec clearly mentions, at the beginning of the 19th century, the type of work carried out by journeymen engaged in stocking the icehouse.[103] Day labourers were also paid to arrange and crush the ice.[104] The workers were paid in cash; however, in March 1760, for example, the hospital also gave them over *2 pots de vin [et] 3 paintes d'eau de vie*.[105]

Was the Château Saint-Louis Icehouse a Good One?

On the basis of available written testimony, it is difficult to know whether the icehouse at the Château was able to satisfy its users and their needs. Was it because it was only an outbuilding, an utilitarian structure, that we find little mention of it, or was it because it was rarely a source of major problems? The remains uncovered indicate that, because of its location, construction materials, shape, capacity, arrangement, and insulation, as long as it was filled properly, this icehouse would be entirely satisfactory.

WHAT WAS THE ICEHOUSE USED FOR?

In 1754, the Hôtel-Dieu nuns gave orders to have a brass wire mesh installed on the southwest and northeast windows of the icehouse, to prevent rats from coming in.[106] From this, we may conclude that the building was not only used to store ice, but that it also had a cold chamber to keep foods that could attract vermin. The presence of a wire mesh over the mouth of a bottom drain could lead to the same conclusion. These undesirables were feared, not only because of the ravages they could cause in the cold chamber, but also because they could damage the materials used to insulate the ice cellar, or because they could even contaminate the ice itself.

In order to preserve perishable products in one of the rooms of the icehouse, it was not essential to have ice that was clear and clean. The ice was used for many other purposes — in a glass or at the table, in the kitchen, in the living room, or in the sickroom — for which cleanness was desirable, if not essential.

Ice for Drinks

The Greeks and Romans used snow and ice to cool their drinks. Hippocrates was opposed to this practice, particularly in the heat of the summer, because he thought that this could lead to a too-sudden cooling of the body. According to the Greek physician, his contemporaries would, however, put their lives or health in peril rather than deprive themselves of the pleasures of drinking iced water. Even during his campaigns, Alexander the Great did not think of snow as a luxury, and it is said that he wanted to be always able to offer cool refreshments to his ladies.[107] He is also said to have used ice to cool the hundreds of barrels of wine distributed to his troops on the eve of battle. He may have wanted to give them courage! For his part, Nero loved to enjoy his wines well chilled with snow brought down from the mountains by his slaves.[108]

It is said that, at the time of the Crusades, Saladin offered snow water to Richard the Lion Heart. In Turkey, the precious mixture, as well as ice in chunks and sherbets (drinks made with fruit juice) could be easily afforded by everyone during the 16th century. At the same time, in Spain and Italy, the use of snow water was widespread among a rather large number of people.[109] On the other hand, in the court of France, snow was still considered as an effeminate luxury at the end of the century. King Henri III used to add it to his wine, which evidently had the result of diluting it. In his *Ice Book* (1844), Thomas Masters assures us that this method of cooling would nevertheless be used in France throughout the first quarter of the 17th century. This inconvenience would be finally eliminated when the bottle containing the alcoholic beverage would be put in a cooler filled with crushed ice or with water whose temperature had been lowered by adding saltpetre.[110] Glass coolers filled with ice water that could be used both to rinse and cool the cups could be found on the tables of nobles, and on those of the religious and military elites, and later on the ones of the bourgeoisie. In 1729, Bélidor reported that, quite often, icehouses were built in order to give the officers in a garrison the pleasure of enjoying cool drinks in the summer.[111]

In Québec, the Jesuits scandalized Baron Lahontan in the summer of 1684 by drinking iced wine and water. The guest considered this practice too luxurious to be suitable for those in religious orders.[112] In the middle of the next century, persons living in Place Royale owned glass coolers.[113] Moreover, Pehr Kalm mentions that people of quality put ice in their drinking water and wine during the summer.[114] In 1831, the traveller Thomas Fowler reported that, since river water in Québec was warm during the summer season, ice was used to cool the drinking water in the houses of the gentry and in all elegant establishments.[115]

Ice for Frozen Desserts

In ancient times, ice and snow were not only used to cool the palates of drinkers. The famous emperor Nero, for example, had a weakness for a little dessert made of snow flavoured with honey and the juice and pulp of various fruits: the ancestor of modern fruit sherbets! In the 13th century, Marco Polo brought back from China the recipe for a frozen milk dessert that may resemble the ices we enjoy today. Could

this dish have been the precursor of ice cream? The latter was probably created by Italians as late as the 16th century, when ices and sherbets became very popular. Furthermore, it was an Italian, Catherine de Medici, who, undoubtedly with the help of her cooks and chefs, introduced frozen desserts to France when she went there to marry the future king Henri II, in 1533.

At the beginning of the 17th century, Charles I of England seemed to have ice cream served regularly at his table.[116] At that time, it was known that snow or ice mixed with saltpetre could produce a solution with a very low temperature. After this discovery, the fondness for delicious frozen desserts became widespread among Europeans who were well off.[117] Later, thanks to the Italian Procope and other *maîtres limonadiers* in Paris, who formed a Guild in 1676, frozen drinks and ices flavoured with fruits, flowers, anise seed, and cinnamon as well as tangy frangipani sherbets became accessible to the masses.[118]

If we believe Jane Austen, iced desserts were still considered a luxury in England at the beginning of the 19th century. In 1808 she wrote: "[...] In the meantime for Elegance & Ease & Luxury [...] I shall eat Ice & drink French wine, & be above vulgar economy."[119] In the United States, it was at this time that ice cream ceased to be a delicacy reserved for the rich. In 1700, it was served by the Governor of Maryland. In 1777 New York confectioners started to advertise it in their newspapers. George Washington and Thomas Jefferson developed a true passion for this dessert, and it dazzled the high society invited to state dinners at the White House. In his *Physiologie du goût*, the French gastronome Brillat-Savarin recounts the success enjoyed by one of his fellow-countrymen who sold ices and sherbets to the citizens of New York in 1794 and 1795. The need had been created. At the beginning of the 19th century, the custom of collecting ice had become common, and well-insulated icehouses became widespread throughout the United States. Consequently, the number of confectioners increased, and ice cream parlours and itinerant vendors made their appearance.[120]

Iced *liqueurs*[121] may have been introduced in Québec at the time of the French regime, and were at least known among the people of quality who could attract the services of an experienced chef. Among the various desserts offered to Pehr Kalm by the nuns of the Hôpital Général in Québec, no mention was made of *neiges*[122], sherbets, or other frozen delights.[123] But this does not mean that the raspberry, strawberry, and blueberry liqueurs that were sometimes listed among their purchases, could not have been used to flavour homemade ices.[124] We may be absolutely certain that, even though, according to Mrs. Simcoe, Canadian icehouses were rarely used to make ices for dessert, the Québec upper crust of the end of the 18th century was nevertheless able to enjoy these pleasures. Indeed, the wife of the colonel recounts that ices were in great demand during a dinner held by the Honourable Judge Thomas Dunn in November 1794, when the stoves were so hot, that the temperature may have reached 90°F.[125]

Ice and snow did not only play an important role in the making of these gorgeous and delicious refreshments. The conservation and presentation at the table of these iced delights, as well as creams and compotes, sometimes also required the services of the precious frozen substance. On the one hand, the containers used in the kitchen and the pantry, the counter of the ice cream parlour and the cart of the itinerant seller could be placed on a block of ice or sunk into a basin filled with snow or crushed ice. On the other hand, in the 17th century, there was a serving platter, made of glass or ceramic, that made it possible to combine coolness and refinement at the table. This cooler consists of a container with side handles and two independent parts, which were generally cylindrical in shape, and designed to fit one into the other, but keeping the walls and bottom from touching; this was topped by a cover with a raised edge, that formed another container. The food placed in the inner dish was kept cool between two layers of ice, one placed in the space between the two platters, and the other on the cover.[126]

Ice for Medicinal Purposes

While some may appreciate the pleasures that can be enjoyed by having snow or ice, others can but bless the heavens for their favourable effects on health. Well before they were able to understand that the bacteria responsible for spoiling meat, fish, and vegetables become more or less inactive at low temperatures, it was known, from experience, that food stays edible much longer when kept at low temperatures. There are documents that bear witness to the fact that, in Québec City, during the French regime, cold was used to preserve foods. Many times, travellers mentioned that, through freezing, food stores remained good to eat, even without salt, until the spring.[127] It sometimes happened that a spell of good

weather would come right in the middle of the winter. In January 1795, Mrs. Simcoe feared that meat bought, as usual, in large quantities in the fall would become spoiled.[128] Governor Dalhousie mentioned a similar situation in 10 December 1826:

> *Much alarm in the kitchen department all over the Province, in as much as the stores of frozen meat, poultry & fish will be utterly destroyed if such weather lasts in the melting mood.*[129]

This natural resource was generally available without cost, and every year at the same time. Baroness de Riedesel could not get over her amazement when she was assured, in the autumn of 1781, that she could store provisions such as fish and poultry, in the attic, for the winter.

> *Tout ce qu'il y avait à faire, quand nous avions besoin de quelque chose pour la table, tel que viande, poisson, oeufs, pommes ou citrons, était de les placer dans l'eau froide le jour précédent. De cette façon, le froid s'en retirait et la viande, tout comme le poisson, redevenaient tendres et juteux.*[130]

Mrs. Simcoe, however, was not as favourably impressed with the results. It seems that she was more than homesick when she complained, in 1792, that the cooks were not as competent as those in England and that, since the food was all frozen, it was not as tasty.[131] The reason is that, when it is frozen slowly, the process breaks up the cells and food becomes dehydrated, and loses taste and consistency. Meat thus frozen cannot be roasted.[132] Fifteen years later, John Lambert recounted how, during the month of April, he had tasted turkeys that had been stored for the winter in a cellar or a garret, and that he had found them remarkably good.[133] Perhaps, they had been buried in snow as it was apparently done with chickens, and feathered game?[134] This custom, which Mrs. Simcoe qualified as a "New York" habit, was thought to make it possible to retain the juices of the poultry much better than when the frozen bird was hung.[135]

We may imagine that freezing is not always desirable. Moreover, in some seasons, it is simply impossible. On these occasions, the block of ice carried in a bed of straw to the kitchen or pantry spared many good people an ill day, by keeping fish and poultry from spoiling while waiting for their turn to go into the cooking pot! Moreover, how many pans and jugs of milk could have been enjoyed fresh thanks to the frozen blocks that took turns to cool them in the dairy house? Mrs. Simcoe also wrote of to the use of ice to cool butter.[136]

Contrary to what Hippocrates believed, drinking iced liquids, particularly during the dog days of summer, is often considered to be very beneficial. According to *A Dictionary of Arts [...]*, this lifts the state of lassitude and torpor, and cures indigestion, and the almost total loss of appetite and occasional dysentery, that may be caused by excessive heat.[137] According to *Rural Residences* (1818), suitably arranging pieces of ice in one of the rooms of the house during a suffocatingly hot day produces cooling air currents activated by the hot air.[138] This is similar to the advice provided in the 1988 version of Environment Canada's *Canadian Weather Trivia Calendar*: "In the hot weather, sit in front of a fan placed behind a bowl filled with ice cubes."[139]

In earlier societies, the health benefits provided by the availability of ice at all times were not limited to the prevention of disease. In Malta, the Knights thought that snow was the only remedy that could save them from dying of their various ills.[140] For his part, in 1824, Sir Walter Scott assured us that ice safely stored in an icehouse by a vigilant gardener, during the previous winter, made it possible to save the life of his best friend, who had injured his head when thrown from his horse. Thanks to the continuous application of ice on the head of the patient, his pulse, which had risen dangerously as the result of a very high fever, could be lowered and kept at a safer beat.[141]

The Refrigerator of Yesteryear

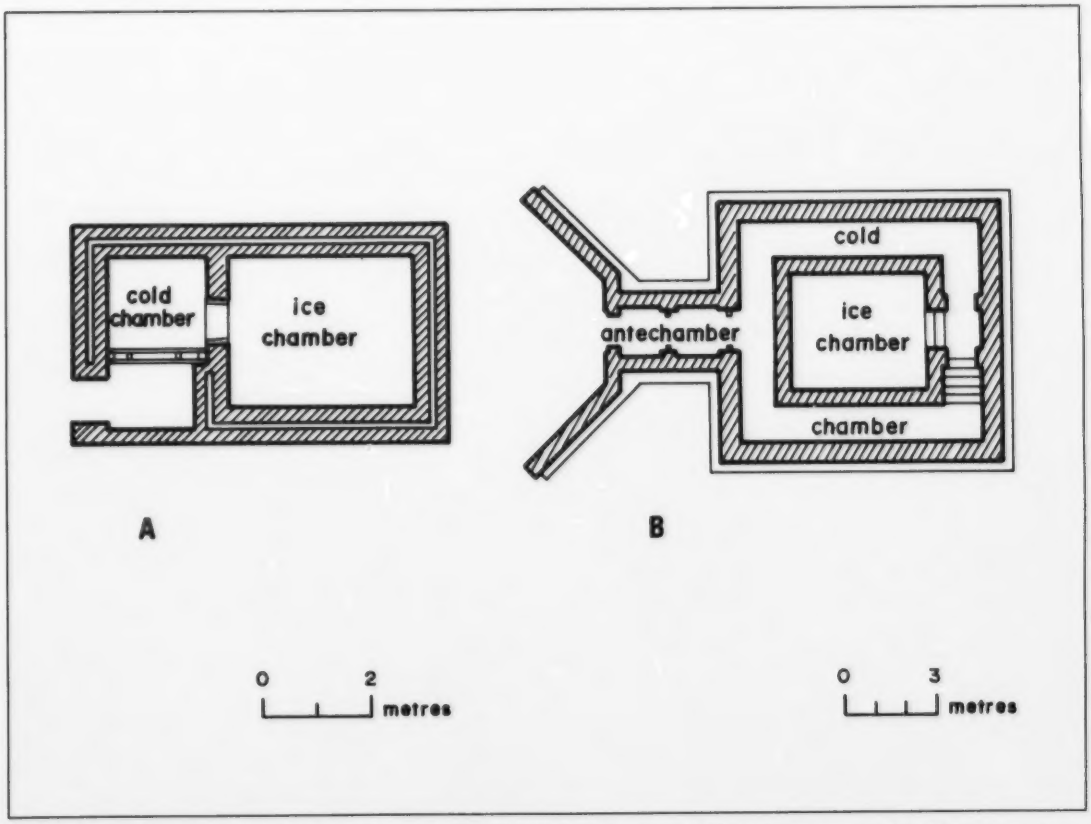
It seems that 2,000 years before icehouses were introduced in England and America in the 17th century, the people of China were already storing their food in underground structures filled with ice.[142] Whereas the first European icehouses, which formed part of the "technical" accoutrements of the most elaborate establishments, were generally used as ice reservoirs rather than as food storage facilities.[143] Nevertheless, little by little, people became aware of the advantages offered by an icehouse when it was used as a cold chamber. In 1755, a dictionary asserts not only that ice could be used to store the victuals that can so easily spoil during the summer, but also that it could be used to restore those that had started to become tainted![144] For its part, Loudon's *Encyclopedia* praises the great usefulness of the icehouse to the

gardener. When stored in an icehouse, vegetables such as peas, beans, and cauliflower stay fresh for some time after harvesting. The temperature of the room, which may be kept at about 4.5°C, or slightly above the freezing point, during the whole summer, also makes it possible to slow down the sprouting of potatoes, other tubers, bulbs, plants in pots, and cuttings. During the winter, the cold chamber could protect any beehives placed there for hibernation from any sudden jump in temperature.[145]

Without repudiating its primary function, the architecture of the icehouse was modified to suit its new uses.

> *Petit à petit, le mode constructif évoluera pour permettre l'aménagement de logettes de conservation d'aliments dans le couloir d'accès puis plus tard, d'y prévoir une antiglacière ou chambre froide de dimensions parfois conséquentes.*[146]

Well protected, the antechamber built at the entrance to the icehouse was in fact cool enough to store perishable materials. Shelves could be built along the walls of the antechamber or, if the walls were made of masonry, nooks could be cut into them to provide storage. When needs were greater, as in the case of a German pharmacist who wanted to keep in his cellar mineral water produced during the day, the number of antechambers would multiply, lose their corridor shape, and assume the proportions of a storage room[147] (Fig. 2.17a). A gallery built around the ice reservoir could also be used as a cold chamber (Fig. 2.17b). This solution was proposed, among others, in the February 1842 issue of the *Gardeners' Chronicle*, for the construction of a fruit storage room.[148] Another example of this type of arrangement was provided in the 19th century in a plan drawn by a German Baron, who wanted to keep his meat and preserved foods fresh during the summer.[149] According to Loudon, many icehouses built along these lines were equipped with recessed shelves in the outside facing of the thick walls of the ice chamber, and in the external wall facing it. The cold storage room was vaulted and had two or three small openings covered with gratings which, when not sealed with closely fitted stones, allowed the passage of light and air. In Europe, antechambers and



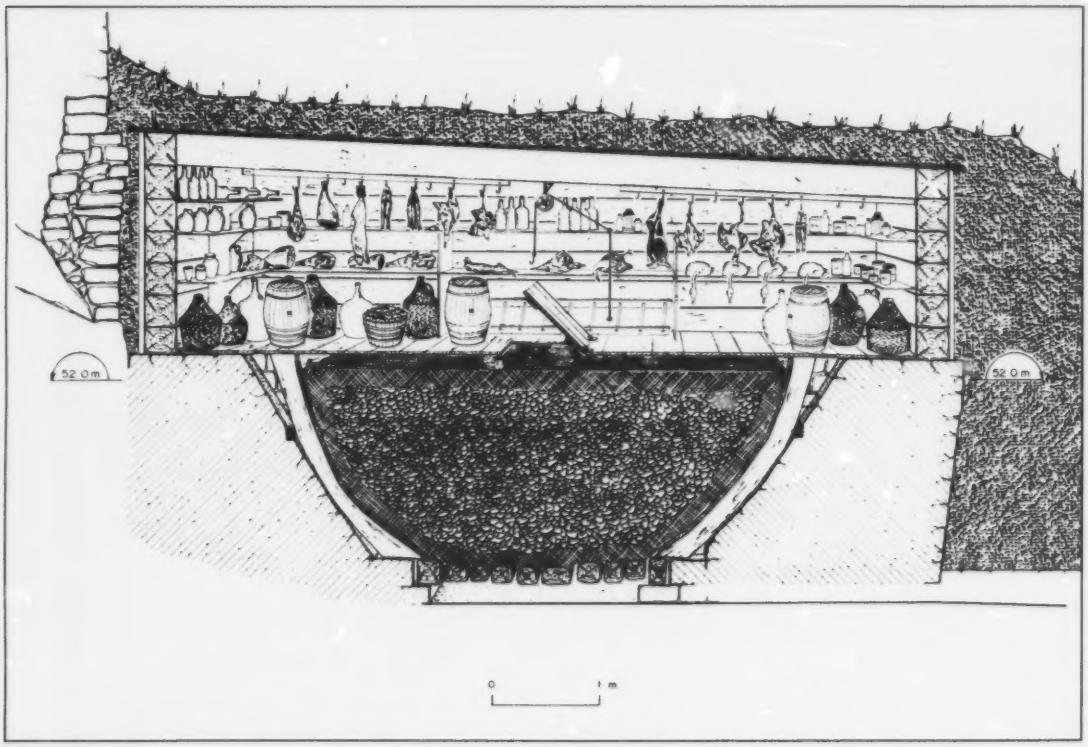
2.17 Icehouses with cold chambers: a) One of the antechambers is used for cold storage; b) Cold chamber surrounding the ice reservoir.
(Drawing based on I. Schlesinger, *op. cit.*, plate II, Figs. 1 and 5; Canadian Parks Service, drawing: François Pellerin; 88-38G-D7)

galleries were built not only in underground icehouses, but also in those built above ground. The warehouses built to store beer in Germany are a good example.[150]

According to Mrs. Simcoe, in Canada icehouses were used as pantries to store meat.[151] On all evidence, they were the best place to do this, particularly when the meat had not been preserved in any way. It is, however, difficult to evaluate to what extent the icehouse was effectively used as a "refrigerator" in this area. We do not know, for example, whether the ice stored in the icehouses owned by store owners and hotel keepers in Montréal, at the beginning of the 18th century, were used to keep meat during the four months of intense heat inside or outside the building.[152] Pehr Kalm does not specify either whether the meat from slaughtered animals that could not be consumed at one time was kept fresh in an icehouse or elsewhere.[153] In effect, there were other places where people could store ice, in order to keep meat and fish fresh, however briefly; and where less delicate foods, and those that were suitably processed, could be stored. In the second basement of the Sulpician Seminary in Montréal, there was a root cellar and a storeroom and, in the third basement, a small meat cellar known as a "jambonnier."[154] At the Hôtel-Dieu in Québec, the nuns had outfitted their house with a dairy, a root cellar, an egg room, and a larder.[155] In the Château Saint-Louis, meat was kept in a large cupboard and in a larder. Food products could also be stored on shelves built in the cellars, in the pantry, and in the dairy.[156]

A document of the Hôpital Général in Montréal reveals that many of the townsfolk stored their meat in the very good icehouse the nuns had on their property in the 18th century.[157] Unfortunately, we do not know how this food compartment was arranged. By about 1780, along the river, the foods are said to have been placed on a clean plank that was used to cover the underground ice reservoir.[158] Even though used in the more rural areas, this type of icehouse, where the cold chamber seems so rudimentary, was not characteristic of those that were built in some farms in the 19th century and later. At that time, above-ground (or only partly buried) icehouses were starting to make an appearance. In some cases, these were used as dairies, or were attached to a cold chamber that was used for that purpose.[159]

In 1851, the *Journal d'agriculture [...] du Bas-Canada* recommended the use of a type of icehouse where an actual room was built over the ice cellar. A floor with a trap door was used to separate the two superimposed spaces, and fans installed in the gables of the roof were used to remove hot air in the



2.18 What did the well-stocked interior of the 1771 icehouse look like? (Canadian Parks Service, drawing: François Pellerin: 88-38G-D4)

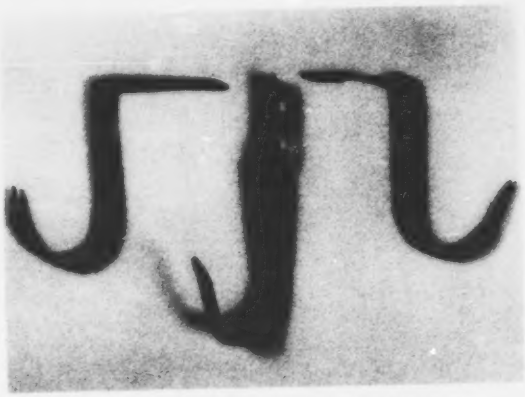
2.19 Iron bar with hooks used to hang food in the cold chamber of the icehouse.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-35)

summer.[160] The icehouse in the Louisbourg Fortress, like that built by R. Morris in Philadelphia, are good 18th-century examples of this type of structure. As we have seen, in Louisbourg, the cold chamber measured approximately six feet high from the floor at ground level, to the beginning of the roof. Buiit over a larger reservoir, the walls of the cold storage room erected by the American Morris, were about ten feet high and were plastered on the outside. Both the ceiling and the floors were insulated.

The above-ground section of the French icehouse at the Château Saint-Louis had windows and shutters that could be used to control the temperature and humidity inside the building to a certain extent. It seems that the cold chamber built over the British icehouse, at least at the beginning, also had windows that could be closed using double shutters. A floor over the entire inner area of the room would offer a spacious stretch of 8.55 metres by about 7.0 metres for the storage of various goods, and ease of circulation (Fig. 2.18). The account books show that two racks were installed in 1773, and that shelves were built in 1779.[161] If the wooden platform covered only the top of the masonry walls of the reservoir — as may later have been the case — the available space would shrink to a corridor measuring only 26.4 metres in length by about 1.2 metres in width. This corridor could have been expanded: timbers embedded in the narrow slanting grooves at the top edge of the north and south walls of the reservoir could have served to support a gallery overhanging the ice storage room. On the other hand, the same remains could have been used to support a railing or a dividing wall built around the reservoir, and thus point to the presence of a much smaller cold chamber.

The height of the room is not known. The Duberger model shows the layout of the landscape outside, rather than the free height inside. It also shows that the roof of the icehouse was lower than that of neighbouring buildings; but this does not mean that it was difficult to move around inside. The archaeological excavations have revealed that the floor of the cold chamber was located at a level that was lower than those of the wood shed and the stables. A 3-metre long strip of forged iron, still carrying thirty-five of its thirty-six original hooks, was discovered in the demolition debris that filled the ice reservoir (Fig. 2.19). This iron bar, which measures 6.5 centimetres wide by 1.1 centimetres thick, was secured to the ceiling around the middle of its length by a forged ring bolt, which had a sharp 18–centimetre tip with four barbed sides. To prevent it from swivelling, it could be attached to the wall by one end, which has been folded at right angles, and through which three holes have been drilled. Hooks are attached to the bar every 6.5 centimetres, with the blunt end hammered against the support to form a rivet. Arranged in succession on one side and the other of the bar, the hooks were undoubtedly used to hang all sorts of victuals, including fresh, smoked, or dried meats, either whole or in quarters, or made into sausages. The bone remains found in the building call to mind the cuts of beef, veal, mutton, pork, moose, and caribou that had probably been wrapped in icehouse cloths;[162] the poultry, such as chickens, turkeys, and domestic geese; the small game, including duck, grouse, passenger pigeons, hares, and even beaver; as well as the freshwater, anadromous, and marine fish that could one day have been suspended from those hooks, away from the rats.[163] Other hooks found may have been used to hang a chain of garlic or lantern from a wall or beam (Fig. 2.20). Three of these had iron spikes for hanging, while the fourth had two holes.

Since the icehouse was located very close to the greenhouses and the Lower Garden, we can imagine that the gardener may have used it to store his bulbs, cuttings, and dormant plants. Also, it was surely convenient to use it to store freshly harvested fruits and



2.20 Forged iron hooks. Height of the centre hook: 158 mm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-47)

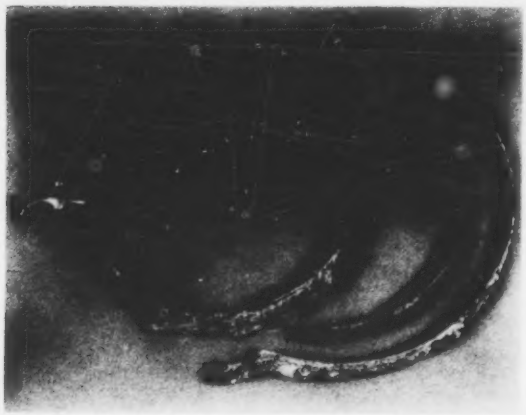
vegetables, and even those bought at the market, before they found their way to the pantry or were required in the kitchen, to be sent to the table, or used in preserves. In this case, it is possible that, once processed, they would again have found their way back to the icehouse.

Remains of several creamware and stoneware pots, coarse earthenware and stoneware jars, stoneware bottles and jugs, glass demijohns,[164] bottles and flasks, as well as of barrels have been found on the site (Figs. 2.21 to 2.31). They could have been used to store jams, liqueurs, syrups, vinegars, salted or marinated vegetables, and salted herbs, as well as oil, water, soda waters or alcoholic beverages, spices, honey, butter and lard, salted fish, and preserved meats, as well as the tallow that was so important in the manufacture of soap and candles.

2.23 Bottles used to store drinks. From left to right: stoneware beer bottle, soda water bottle, and glass wine bottle, all of British manufacture. Height of the body of the wine bottle: 132 mm; diameter at the base: 96 mm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-51)

2.21 Creamware preserve pots. Height of the centre pot: 106 mm; outer diameter: 95 mm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-36)

Of these artifacts, over 2,000 were collected directly from the floor of the cold chamber of the icehouse, mainly in the south side of the building. They include fragments of stoneware jars, jugs, and



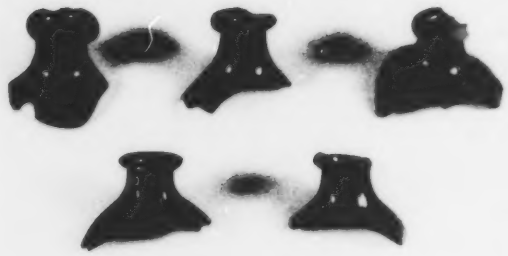
2.22 Iron barrel hoops and brass tap. Diameter of the smallest hoop: 290 mm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-38)

2.24 Coarse earthenware (lower left) and stoneware pots of British origin. Inner diameter of the neck of the top left container: 63 mm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-30)

bottles, as well as glass bottles, flasks, and demijohns. The latter were the most numerous and belong to at least five of these large containers, four of which were dark green in colour, and one of light green glass (Fig. 2.31). In all cases, the upper part of the neck was broken above the string rim. The diameter at the point of breaking varies from three to six centimetres. The string rim consists of a band of glass, flattened in one case at its point of junction. The diameters of the bottom and the body of the reconstructed demijohns measure 20 and 45 centimetres respectively, and the height may reach at least 50 centimetres. It was impossible to measure the capacity of the containers.

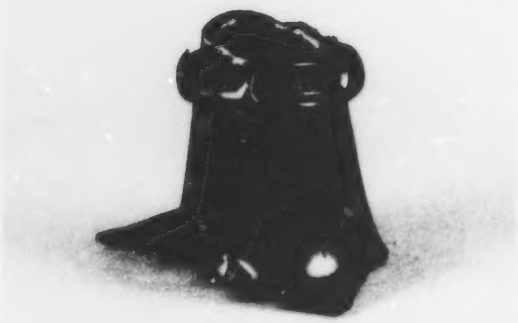
The Governor's household had many resources when it came to store perishable products. Apart from a pantry, a larder, a storeroom, cellars, and a dairy, the cold chamber of the icehouse was used to store many of the goods necessary to sustain life at the Château.

The cold chamber and the ice pit may also have continued to be used for these purposes even after the Château's fire and the departure of the Governor. Indeed, the gardeners — one of whom, Richard Clancy, occupied the old Château kitchen — and other employees of the government probably saw the advantage of maintaining and using the building, which would be finally demolished in 1854.

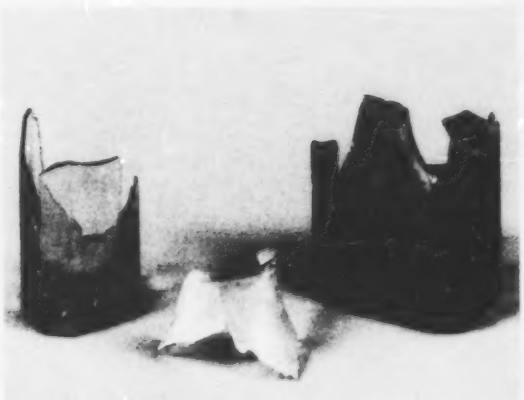


2.25 Necks and finishes of British glass bottles. Inner diameter of the necks: 13.5 to 17 mm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-57)

2.27 Seal of a glass bottle used to contain superfine clarified olive oil from Bordeaux.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-29)



2.26 Neck and finish of a glass demijohn. The ring is stamped with the name Watson & Son. External diameter under the ring: 69 mm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-53)



2.28 At left and right: two glass bottles that could have been used to store oil, sauces, powdered spices, or liquid preserves. In the centre: the neck of a light green glass container discovered on the floor of the icehouse.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-45)

In conclusion, the icehouse unearthed under the Dufferin Terrace was built at a time when such North American structures were still placed underground, following the European model. The subterranean ice reservoir had masonry walls, which indicates that this was an important construction, made to last; this may have also been evidence of efforts to prevent water from getting into the crevices of the schistose rock where it was built. The shape is reminiscent of that of a Maryland icehouse, where not so long before the inhabitants had been British subjects, and those of icehouses built in French military forts. These influences may have coincided with proportions that were strongly suggested, if not determined, by the presence of rock.

The amount of ice that could be stored is slightly less than could be kept in the icehouse at the Fortress of Louisbourg, but more than could be stowed in the reservoir that supplied the Master's house of the Saint-Maurice Ironworks. It was probably large enough to keep some water frozen until the fall. The Château's icehouse was fairly well protected against humidity and heat. It may be criticized because, at least at the beginning, it was covered with soil rather than thatch; however, in this, it imitated many of its contemporaries: thatch, which is very flammable, is not quite suitable for use in town. Moreover, as the other outbuildings sprouted all around, it lost a little more of its exposure to the air and sun, a situation that is less compatible with a sodded roof. But, was the icehouse still sodded after the construction of the greenhouse and its lean-to? In accordance with the recommendations made in the dictionaries and encyclopaedias of the time, the reservoir was built in a slope. Care was taken to protect it from surface run-off, and the ice inside was effectively insulated from dripping water which was carried away by a drain. The latter does not seem to have been equipped with a true trap, as was recommended in the 19th century; but its zigzag path represents an ingenious and original attempt to protect the ice against air currents. The ice was kept apart from the masonry walls of the reservoir by a solid wooden wall — this is not the case in the icehouses described by Diderot and Philip Miller, nor in that built by Robert Morris in Philadelphia; but Pehr Kalm observed similar construction methods in Québec — and wheat straw. As far as the filling operation is concerned, whether this involved snow or ice, we may imagine that it was carried out with the same care as that taken in the construction itself.

The Château cooks had a cold-storage facility that had nothing to envy from contemporary European icehouses. Why should they not be able to serve iced water and wine, as well as the sherbets, frozen beverages, and ice creams, for which they themselves had brought treasured recipes to this continent? Ice chunks were certainly used to keep fish and meat temporarily fresh, and maybe also to soothe the headaches of a Governor who may have been

2.29 At the bottom, a stopper found on the floor of the icehouse, together with a jar (top) and two pots found in the southeast courtyard. British stoneware. Height of the jar: 179 mm; diameter at the base: 87 mm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-42)

2.30 Stoneware jugs found on the site. The one on the right is a North American product, and the two others are British. The bottom (diameter: 253 mm) came from the icehouse.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-94)

feverish or preoccupied with the problems of the day. Finally, the Château's household enjoyed the services of a very effective "refrigerator," where everything that one may have wanted to preserve during the hot season could be kept at a relatively constant cool temperature.

This domestic amenity would have gone a long way to make daily life more comfortable; however, like the greenhouse and the pleasure garden, it was only to be expected. The Governor's Château could not lag behind the other grand homes owned by the upper crust of the city and the colony.

M. E. ■

2.31 Glass demijohns found on the floor of the icehouse, in the process of restoration.
(Canadian Parks Service, photo: Jean Jolin; 000/TE/PR-6/S-47-10)

NOTES AND REFERENCES • Chapter 2

1. L.A. Aylmer, Montréal, 10 June 1831, "Recollections of Canada," *Rapport de l'archiviste de la province de Québec pour 1934-1935* (RAPQ) (Québec, Rédempti Paradis, 1935), p. 310.

2. L.A. Aylmer, William Henry, 4 August 1831, *RAPQ pour 1934-1935*, p. 314; Emy, *The Art of Making Frozen Desserts*, cited in Paul Dickson, *The Great American Ice Cream Book* (New York, Atheneum, 1972), p. 19.

3. Diderot and D'Alembert, *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers, par une société de gens de lettres* (New York, Readex Microprint Corporation, 1969, reprint of the edition published in Paris by Briasson, David L'Aîné, Le Breton, Durand, between 1751 and 1765), vol. 2, tome VII (1757), *see* "GLACIERE".

4. P. Dickson, *op. cit.*, p. 15; Monica Ellis, *Ice and Icehouses Through the Ages: with a Gazetteer for Hampshire* (Southampton, Southampton University Industrial Archaeology Group, 1982), p. 1.

5. M. Ellis, *op. cit.*, p. 14; Fernand Braudel, *La Méditerranée et le monde méditerranéen à l'époque de Philippe II* (Paris, Armand Colin, 1985, 6th edition), Vol. 1, p. 25-26.

6. P. Dickson, *op. cit.*, p. 17; Thomas Masters, *The Ice Book: Being a Compendious History of Everything Connected With Ice [...]* (London, Simpkin, Marshall & Co., 1844), p. 27; Paul Robert, *Le Petit Robert 1: Dictionnaire alphabétique et analogique de la langue française* (Montréal, Les Dictionnaires Robert–Canada S.C.C., 1987), *see* "Glacière".

7. M. Ellis, *op. cit.*, p. 1; Audrey Noël Hume, *Food* (Williamsburg [VA], The Colonial Williamsburg Foundation, 1978, Colonial Williamsburg Archaeological Series No. 9), p. 10.

8. Joseph C. Jones, Jr., *America's Icemen: An Illustrative History of the United States Natural Ice Industry 1665-1925* (Humble [Texas], Jobeco Books, [1984]), p. 14.

9. Louise Dechêne, *Habitants et marchands de Montréal au XVII^e siècle* (Montréal, Plon, 1974, Civilisations et mentalités collection), p. 323, note 74.

10. Jacques Rousseau, "Quelques jalons de l'histoire et de la géographie gastronomique du Québec," *Cahier des dix*, nº 32 (Montréal, Édition des dix, 1967), p. 18.

11. L. Dechêne, *loc. cit.*; Michel Lessard and Huguette Marquis, *Encyclopédie de la maison québécoise* (Montréal, Les Éditions de l'Homme, 1972), p. 653.

12. Pehr Kalm, *Voyage de Pehr Kalm au Canada en 1749*, (Montréal, Pierre Tisseyre, 1977, annoted translation of the travel journal by J. Rousseau and G. Béthune with the co-operation of Pierre Morisset), p. 404.

13. Baroness de Riedesel, in B. Dufebvre, *Cinq femmes et nous* (Québec, Belisle, 1950), p. 93.

14. M. Lessard and H. Marquis, *op. cit.*, p. 625.

15. Thomas Jefferson, *Thomas Jefferson's Garden Book 1766-1824: With relevant extracts from his other writings*, annotation Edwin Morris Betts (Philadelphia, The American Philosophical Society, 1944), p. 565; Archives du monastère de l'Hôtel-Dieu de Québec (AMHD-Q), *Livre de dénombrement des terrains appartenant à la communauté de l'Hôtel-Dieu de Québec, 1739* (1790 copy), TR-3, p. 67; AMHD-Q, "Plan tiré par Mr Noël Levasseur Arpenteur, en 1748 du terrein des Religieuses de l'Hôtel-Dieu," PR 4-00020-002; J.Ch. Krafft, *Recueil d'architecture civile* (Paris, Bancé aîné, 1829, new edition) book 13, plates 73 and 76, book 16, plate 92, and book 18, plates 105-106.

16. Robert Lahaise, *Les édifices conventuels du vieux Montréal* (Montréal, Hurtubise, HMH, 1980, Cahiers du Québec), p. 457.

17. Jacques Guimont (Ethnotech Inc.), *Étude sur l'évolution historique du secteur du Château Saint-Louis et de sa zone limitrophe de 1760 à 1838*, Microfiche Report No. 45 (Parks Canada, Ottawa, 1983), p. 107.

18. J. Ch. Krafft, *loc. cit.*

19. Baroness de Riedesel, in B. Dufebvre, *op. cit.*, p. 93.

20. Thomas Moore, *An Essay on the Most Eligible Construction of Ice-Houses: Also, A Description of the Newly Invented Machine Called the Refrigerator* (Baltimore, Bonsal & Niles, 1803), p. 9.

21. Pierre Drouin, "Report on Archaeological Research at the Master's House of the Forges du Saint-Maurice," *Research Bulletin*, No. 144 (Parks Canada, Ottawa, September 1980), p. 12.

22. Philip Miller, *Dictionnaire des jardiniers* (Paris, Guillot, 1785, translation of the 8th edition [1768] of *The Gardener's Dictionary*), *see* "ICE HOUSES".

23. A. Noël Hume, *op. cit.*, p. 10.

24. H. Paul Thibault, "La glacière de l'îlot 17," file prepared under the direction of Pierre Bureau (Parks Canada, [Louisbourg], October 1968), p. 5, 13-15. At about the same time, the nuns of the Notre-Dame congregation in Montréal built a stone icehouse. Unfortunately, we do not know whether this was an underground icehouse (R. Lahaise, *op. cit.*, p. 131).

25. Robert Morris to George Washington, Philadelphia, 15 June 1784, in J.C. Jones, Jr., *op. cit.*, p. 76.

26. National Archives of Canada (NAC), RG1, E15A, vol. 13, 12 November 1771.

27. *Ibid.*, vol. 22, 5 November 1781.

28. John Claudius Loudon, *An Encyclopaedia of Gardening* (London, Longman, Orme, Brown, Green, and Longmans, [1846], new enlarged and improved edition, with a foreword by J.C.L. [1834]), *see* "Of the Ice-house and its Management".

29. M. Ellis, *op. cit.*, p. 4; H.P. Thibault, *op. cit.*, p. 5.

30. H.P. Thibault, *op. cit.*, p. 7; *ibid.*, p. 20a: Bernard Forest de Bélidor, *La Science des Ingénieurs dans la Conduite des travaux de fortification et d'architecture civile* (Paris, Claude Jombert, 1729), book IV, p. 80.

31. T. Jefferson, "Jefferson Papers," L.C., in *Thomas Jefferson's Garden Book [...]*, p. 278 and plate XVIII.

32. AMHD-Q, "Plan tiré par Mr Noël Levasseur, en 1748 [...]," PR 4-00020-002; "Contoured Plan of the Environs of Quebec," 1865-66, in André Bernier, *Le Vieux-Sillery* (Québec, ministère des Affaires culturelles, 1977, Les cahiers du patrimoine, nº 7), p. 64, 77; R. Lahaise, *op. cit.*, p. 136, 140, 169, 170, 267.

33. Pierre Drouin, *La Grande Maison des Forges du Saint-Maurice: rapport archéologique, 1977-1978*, Microfiche Report No. 278 (Parks Canada, Ottawa, 1982), p. 88.

34. T. Moore, *op. cit.*, p. 11.

35. Matthew Carey, ed., "Of Ice and Icehouses," *The American Museum, or, Universal Magazine: Containing Essays on Agriculture – Commerce – Manufactures [...]* (Philadelphia, Sept. 1792).

36. On the *Plan du château de Québec* of Sieur de Villeneuve (Fig. 2.1), the fact that a roof appears on each of the buildings shown suggests that the pyramid drawn by the author in the middle of the French icehouse also represents the roof. Nevertheless, it is possible that the illustrator wanted to depict the shape of the interior of the reservoir. If this was the case, the construction would have been similar to that built by the British some 80 years later.

37. *Encyclopédie du XIX^e siècle: répertoire universel des sciences, des lettres et des arts, avec la biographie de tous les hommes célèbres* (Paris, Au Bureau de l'Encyclopédie du XIX^e siècle, 1851), *see* "GLACIERE"; Diderot and D'Alembert, *loc. cit.*; Andrew Ure, *A Dictionary of Arts, Manufactures and Mines Containing a Clear Exposition of their Principles and Practice* (New York, D. Appleton Company, MDCCCXLV [1845]), *see* "ICE-HOUSE".

38. M. Carey, ed., *op. cit.*; M. de Perthuis, *Traité d'architecture rurale* (Paris, Chez Deterville, 1810), p. 122.

39. *Encyclopédie du XIX^e siècle*, *loc. cit.*

40. P. Miller, *loc. cit.*; J.C. Loudon, *loc. cit.*

41. M. Ellis, *op. cit.*, p. 19-20.

42. *Encyclopédie du XIX^e siècle*, *loc. cit.*

43. P. Miller, *loc. cit.*

44. A. Charbonneau, Y. Desloges and M. Lafrance, *Québec, ville fortifiée du XVII^e au XIX^e siècle* (Québec, Pelican and Parks Canada, 1982), p. 125-126.

45. B.F. de Bélidor, *loc. cit.*

46. P. Miller, *loc. cit.*; T. Moore, *loc. cit.*

47. B.F. de Bélidor, *loc. cit.*

48. G. Washington to Augustine Washington, June 1791, in John C. Fitzpatrick, ed., *The Writings of George Washington from the Original Manuscript Sources 1745-1799* (Washington, U.S. Govt. Print. Off., 1931-1944), vol. XXXI (1939), p. 309.

49. B.F. de Bélidor, *loc. cit.*

50. T. Moore, *op. cit.*, p. 12.

51. Diderot and D'Alembert, *loc. cit.*

52. J. Guimont (Ethnotech Inc.), *op. cit.*, p. 108; NAC, RG1, E15A, vol. 269, 5 November 1818.

53. R. Morris to G. Washington, 15 June 1784, in J.C. Jones, Jr., *op. cit.*, p. 76; *Encyclopédie du XIX^e siècle*, *loc. cit.*

54. H.P. Thibault, *op. cit.*, p. 7, 9, 14a: Dépôt général des fortifications, "Note sur l'usage des glacières," 20a: B.F. de Bélidor, *loc. cit.*

55. R. Morris to G. Washington, 15 June 1784, in J.C. Jones, Jr., *loc. cit.*

56. Isidor Schlesinger, *Der Eiskellerbau in Massiv – und holz - Construction* (Berlin, Ernst & Korn, 1864), p. 6.

57. T. Moore, *op. cit.*, p. 11-13.

58. T. Jefferson to John Freeman, 7 February 1806, in *Thomas Jefferson's Garden Book [...]*, p. 314-315.

59. L. Dechênes, *loc. cit.*, note 74.

60. Pierre Cardinal (AnthroSpec), "1er hôpital Général de Mtl. 1692-1872. Rapport final concernant les fouilles archéologiques de 1979 & 1980. BiFj-4," Manuscript on file (Direction générale du patrimoine, ministère des Affaires culturelles du Québec, Québec, 1981), vol. 1, p. 11.

61. AMHD-Q, *Notes et mémoires des anciennes mères*, Ar. 5, Nº 1, 1716-1774, August 1735; AMHD-Q, *Registre Contenant L'Etat Des Biens, La Recepte, et la Dépence de L'hotel Dieu de Quebec fondé en 1639, par md La Duchesse D'aiguillon pour L'edification et le secour des Sauvages, Et le soulagement des Miserables de la Colonie. Commancé le premier Janvier 1732*, 1732-1775, p. 116 (1745).

62. Diderot and D'Alembert, *loc. cit.*

63. I. Schlesinger, *op. cit.*, p. 5.

64. P. Drouin, *Research Bulletin*, p. 12.

65. T. Moore, *op. cit.*, p. 12.

66. P. Kalm, *loc. cit.*

67. *Encyclopédie du XIX^e siècle*, *loc. cit.*; I. Schlesinger, *loc. cit.*; J.C. Loudon, *loc. cit.*

68. P. Kalm, *loc. cit.*

69. I. Schlesinger, *op. cit.*, p. 8, 9, 11.

70. R. Morris to G. Washington, 15 June 1784, in J.C. Jones, Jr., *loc. cit.*; Diderot and D'Alembert, *loc. cit.*; J.C. Loudon, *loc. cit.*; A. Ure, *loc. cit.*

71. T. Moore, *op. cit.*, p. 14.

72. M. Ellis, *op. cit.*, p. 4.

73. This type of thatched roof had already been recommended by Bélidor, among others (B.F. de Bélidor, *loc. cit.*).

74. T. Moore, *op. cit.*, p. 12-13.

75. H.P. Thibault, *op. cit.*, p. 2, 3, 10, 12, 13, 17, 20a: B.F. de Bélidor, *loc. cit.*

76. R. Morris to G. Washington, 15 June 1784, in J.C. Jones, Jr., *loc. cit.*

77. George Washington, *The Diaries of George Washington*, cited in J.C. Jones, Jr., *op. cit.*, p. 78.

78. Jeannine Laurent and Jacques St-Pierre, *Les forts et châteaux Saint-Louis, 1620-1760*, Microfiche Report No. 40 (Parks Canada, Ottawa, 1982), p. 162-163.

79. For purposes of comparison, a brochure published by Energy, Mines and Resources Canada, and distributed with the country's newspapers in October 1983, says that the external walls of a highly energy efficient house have an RSI value of 2.6 [R 15] (Energy, Mines and Resources Canada, *Home Energy Management: A Planned Approach to Saving Energy Dollars* [n.l., n.d.], p. 11).

80. NAC, RG1, E15A, vol. 13, 12 November 1771.

81. *Ibid.*

82. *Ibid.*, vol. 12, 3 July 1773.

83. *Ibid.*, vol. 13, 12 November 1771; fifteen planks were bought for the construction of the floor.

84. *Ibid.*

85. *Ibid.*, vol. 11, 3 June 1772.

86. *Ibid.*, vol. 18, 31 October 1778 to 30 April 1779.

87. Robert-Lionel Séguin, *La civilisation traditionnelle de l'"habitant" aux XVII^e et XVIII^e siècles* (Montréal, Fides, 1973), p. 353.

88. Diderot and D'Alembert, *loc. cit.*; A. Ure, *loc. cit.*; *Encyclopédie du XIX^e siècle*, *loc. cit.*

89. Correspondence between G. Washington and R. Morris, June 1784, in J.C. Jones, Jr., *op. cit.*, p. 75-76.

90. Diderot and D'Alembert, *loc. cit.*; *Encyclopédie du XIX^e siècle*, *loc. cit.*

91. T. Moore, *op. cit.*, p. 12.

92. Diderot and D'Alembert, *loc. cit.*; J.C. Loudon, *loc. cit.*; A. Ure, *loc. cit.*

93. Diderot and D'Alembert, *loc. cit.*; J.C. Loudon, *loc. cit.*; R. Morris to G. Washington, 15 June 1784, in J.C. Jones, Jr., *loc. cit.*

94. Diderot and D'Alembert, *loc. cit.*; A. Ure, *loc. cit.*

95. T. Jefferson, *op. cit.*, p. 281, 362, 363, 400, 432, 497, 565.

96. J.C. Loudon, *op. cit.*, p. 611; Yves Bergeron, *L'exploitation de la glace naturelle au Québec* (Québec, Université Laval, 1984, Master's Thesis), p. 9.

97. J. Laurent and J. St-Pierre, *op. cit.*, p. 163.

98. AMHD-Q, *Registre Contenant L'Etat Des Biens [...]*, 1732-1775, p. 151 (1749).

99. *Ibid.*, p. 180 (1751).

100. AMHD-Q, [*Hôpital. Recettes et dépenses*], 1825-1859; *ibid.*, p. 139, 139 1/2; AMHD-Q, [*Monastère. Recettes et dépenses*], 1825-1856, p. 24, 114, 129, 407, 444.

101. AMHD-Q, [*Hôpital. Recettes et dépenses*], 1825-1859, p. 145 1/2, 152 1/2, 158 1/2, 167.

102. R.-L. Séguin, *loc. cit.*

103. AMHD-Q, [*Hôpital. Recettes et dépenses*], 1776-1825, p. 207.

104. *Ibid.*, p. 229, 247, 256, 263.

105. AMHD-Q, *Journal General de la Dépence de Lhotel Dieu de Quebec. Commancé ce premier Juillet 1746*, 1746-1781, p. 95.

106. AMHD-Q, *Registre Contenant L'Etat Des Biens [...]*, 1732-1775, p. 205 (1754).

107. P. Dickson, *op. cit.*, p. 15.

108. J.C. Jones, Jr., *op. cit.*, p. 13.

109. F. Braudel, *op. cit.*, p. 25-26.

110. T. Masters, *op. cit.*, p. 30-40; M. Ellis, *op. cit.*, p. 1.

111. B.F. de Bélidor, *op. cit.*, p. 80.

112. Benjamin Sulte, "Les glaces," *La kermesse*, n° 1 (23 September 1892), p. 11.

113. Camille Lapointe (Anthrospec), *Le verre des latrines de la maison Perthuis*, Dossiers, n° 52 (ministère des Affaires culturelles du Québec, Québec, 1981, Les collections archéologiques de la place Royale), p. 46, 160-161.

114. P. Kalm, *op. cit.*, p. 404.

115. Thomas Fowler, *The Journal of a Tour Through British America to the Falls of Niagara [...]* (Aberdeen, Lewis Smith, 1832), p. 49.

116. P. Dickson, *op. cit.*, p. 17-18.

117. J.C. Jones, Jr., *op. cit.*, p. 13.

118. T. Masters, *op. cit.*, p. 47; P. Dickson, *op. cit.*, p. 19; J. Rousseau, *op. cit.*, p. 18.

119. Jane Austen, cited in M. Ellis, *op. cit.*, p. 2.

120. P. Dickson, *op. cit.*, p. 20-27; Brillat-Savarin, *Physiologie du goût* (Paris, Flammarion, 1982, Champs), p. 343.

121. This name was used in the 18th century for all the liquid preparations made for ices (Gilliers, *Le Cannaméliste français [...]*, p. 128, cited in Catherine Arminjon and Nicole Blondel, *Objets civils domestiques: vocabulaire* (Paris, Imprimerie nationale, 1984), p. 222).

122. This name is used for all the *liqueurs* and fruit preparations that are made and iced to serve as "snow" (Gilliers, *Le Cannaméliste français [...]*, p. 153-154, cited in C. Arminjon and N. Blondel, *op. cit.*, p. 110).

123. P. Kalm, *op. cit.*, p. 244.

124. Micheline D'Allaire, *L'hôpital-général de Québec 1692-1764* (Montréal, Fides, 1971, Fleur de Lys Collection), p. 163.

125. Elizabeth Simcoe, 28 November 1794, in *Mrs. Simcoe's Diary*, ed. Mary Quayle Innis (Toronto, Macmillan of Canada, 1965), p. 66, 144.

126. C. Arminjon and N. Blondel, *loc. cit.*; this type of cooler is also known as a cooling dish, snow pot, snow dish, ice dish, cream cooler, cream bowl, or fruit cooler.

127. Y. Bergeron, *op. cit.*, p. 5.

128. E. Simcoe, 22 January 1795, in *Mrs. Simcoe's Diary*, p. 147.

129. George Ramsay, 9th Earl of Dalhousie, 10 December 1826, in *The Dalhousie Journals*, ed. Marjorie Whitelaw (Ottawa, Oberon Press, 1982), vol. 3, p. 88.

130. Baroness de Riedesel, in B. Dufebvre, *op. cit.*, p. 95.

131. E. Simcoe to Mrs. Hunt, 13 February 1792, in *Mrs. Simcoe's Diary*, p. 48.

132. Maguelonne Toussaint-Samat, *Histoire naturelle et morale de la nourriture* (Paris, Bordas, 1987, Cultures), p. 547.

133. John Lambert, *Travels Through Canada and the United States of North America in the Years 1806, 1807, & 1808* (London, C. Cradock and W. Joy, 1813, 2nd corrected and improved edition), vol. 1, p. 75.

134. Baroness de Riedesel, in B. Dufebvre, *loc. cit.*

135. E. Simcoe, 19 December 1791, in *Mrs. Simcoe's Diary*, p. 42.

136. *Ibid.*, p. 66.

137. A. Ure, *op. cit.*, *see* "ICE-HOUSE".

138. M. Ellis, *op. cit.*, p. 7.

139. D.W. Phillips, *Canadian Weather Trivia Calendar – 1988* (Environment Canada, Ottawa, 1987), p. [29].

140. F. Braudel, *op. cit.*, p. 26.

141. M. Ellis, *op. cit.*, p. 2.

142. A. Noël Hume, *op. cit* , p. 10.

143. Jean-Louis Rensonnet, "Ochain et Vierset: anciennes glacières rurales wallonnes: Qu'est-ce qu'une glacière?," *Le Jour* (Belgium), 28 April 1986.

144. Augustin Charles D'Aviler, *Dictionnaire d'architecture civile et hydraulique, et des arts qui en dépendent: comme la Maçonnerie, La Charpenterie, La Menuiserie, La Serrurerie, le Jardinage, & la construction des Ponts & Chaussées, des Ecluses, & de tous les ouvrages hydrauliques* (Paris, Charles-Antoine Jombert, 1755, a new, corrected and considerably expanded edition), p. 191.

145. Byron D. Halsted, *Barns, Sheds and Outbuildings* (Brattleboro [VT], The Stephen Greene Press, 1977, reprint of the original edition published in 1881 by Orange Judd, New York, under the title: *Barn Plans and Outbuildings*), p. 156. M. Carey, ed., *op. cit.*

146. J.-L. Rensonnet, *loc. cit.*

147. I. Schlesinger, *op. cit.*, p. 11.

148. M. Ellis, *op. cit.*, p. 11.

149. I. Schlesinger, *op. cit.*, p. 10 and plate II, Figs. 1 to 4.

150. *Ibid.*, plate III, Figs. 1 to 3, and plates IV, V, and VII.

151. E. Simcoe, *loc. cit.*

152. L. Dechêne, *op. cit.*, p. 323, note 74.

153. P. Kalm, *op. cit.*, p. 404.

154. R. Lahaise, *op. cit.*, p. 245-247.

155. François Rousseau, *L'oeuvre de chère en Nouvelle-France: Le régime des malades à l'Hôtel-Dieu de Québec* (Québec, PUL, 1983, Les cahiers d'histoire de l'Université Laval, nº 29), p. 212.

156. NAC, RG1, E15A, vol. 13, part 2, May to October 1775; *ibid.*, part 1, August to December 1774; *ibid.*, vol. 18, 31 October 1778 to 30 April 1779; *ibid.*, vol. 22, 26 January 1781; *ibid.*, vol. 13, part 2, May to October 1775.

157. P. Cardinal, *op. cit.*, p. 11.

158. Baroness de Riedesel, in B. Dufebvre, *op. cit.*, p. 93.

159. Byron D. Halsted, *op. cit.*, p. 154-169; Y. Bergeron, *op. cit.*, p. 29 to 31.

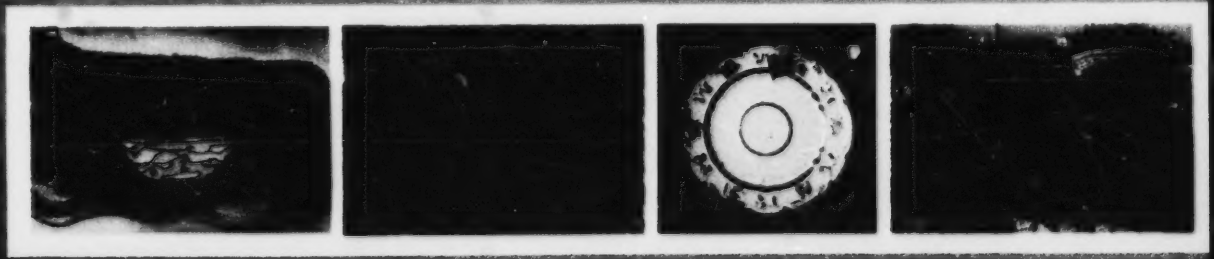
160. "Glacières," *Journal d'agriculture et transactions de la Société d'Agriculture du Bas-Canada* (Montréal), vol. 4, nº 2 (February 1851), p. 56-57.

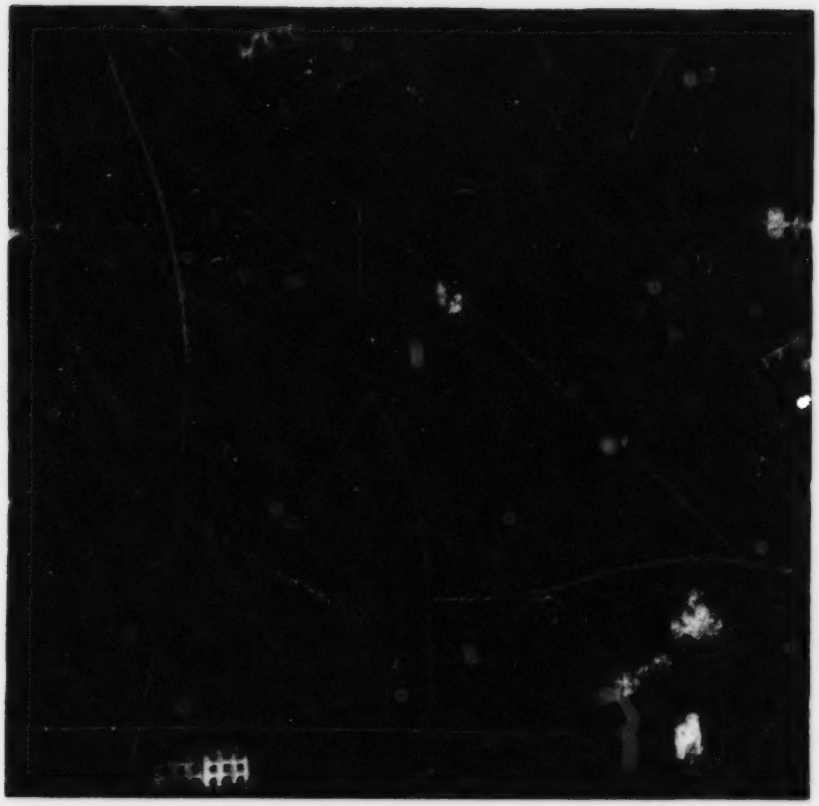
161. NAC, RG1, E15A, vol. 12, 25 December 1772 to 24 December 1773; *ibid.*, vol. 18, 8 May to 31 October 1779.

162. At the Hôtel-Dieu in Québec, heavy fabric was regularly purchased to make *glacière* cloths to wrap the meats. These cloths were kept in the kitchen (AMHD-Q, *Registre Contenant L'Etat Des Biens [...]*, 1732-1775, p. 5, 26, 40, 88, 128, 151, 169, 192, 205, 221).

163. Catherine Yasui, "The Faunal Analysis of Two Structures From the Dépendances du Château Saint-Louis, Québec City, Québec (1771-1854)," manuscript (ZIC, National Museum of Natural Sciences, Ottawa, 1987), to appear in the Microfiche Report Series, Canadian Parks Service, Ottawa.

164. The demijohn is a large glass bottle ordinarily encased in wicker that is used to transport and store liquids (L. Décarie-Audet, N. Genêt and L. Vermette, *Les objets familiers de nos ancêtres* [Montréal, Les Éditions de l'Homme, 1974], p. 107).

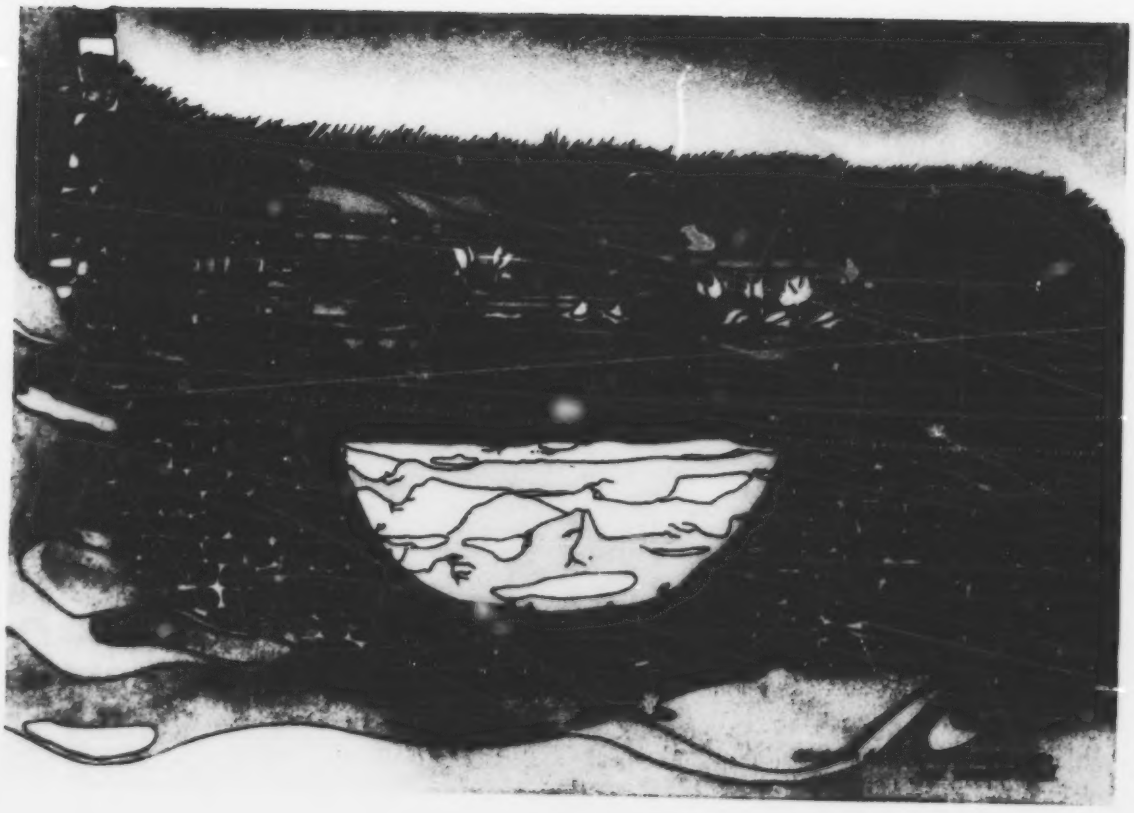




The Chateau Saint-Louis, its yard and gardens as they appear on the Duberger model, 1801-1808.
(Canadian Parks Service, photo by Jean Audet)

Depth of history: schematic profile showing successive occupations of the South-East courtyard of the Chateau Saint-Louis.

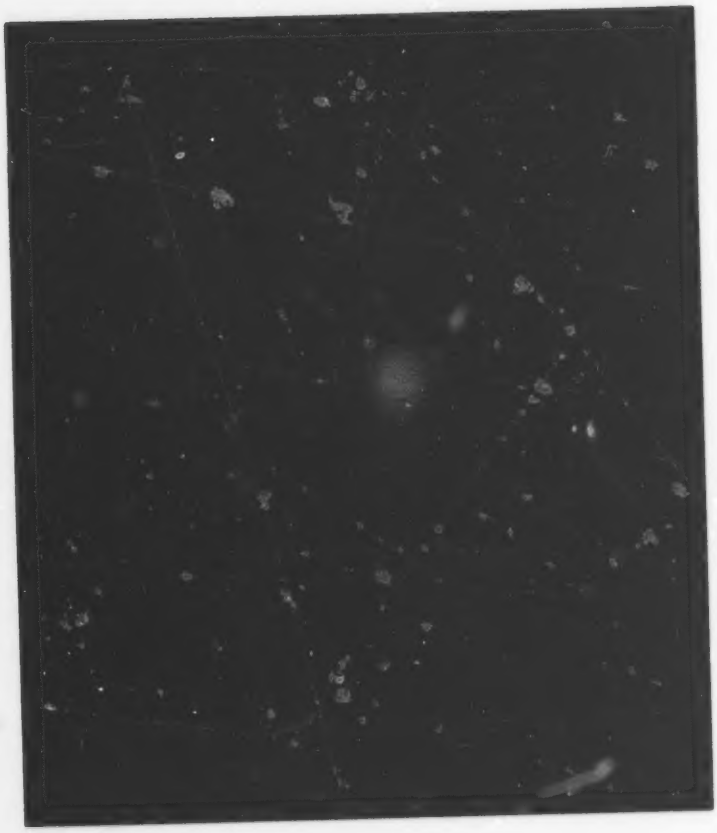
(Canadian Parks Service. Suzanne Duquet from a drawing by François Pellerin)



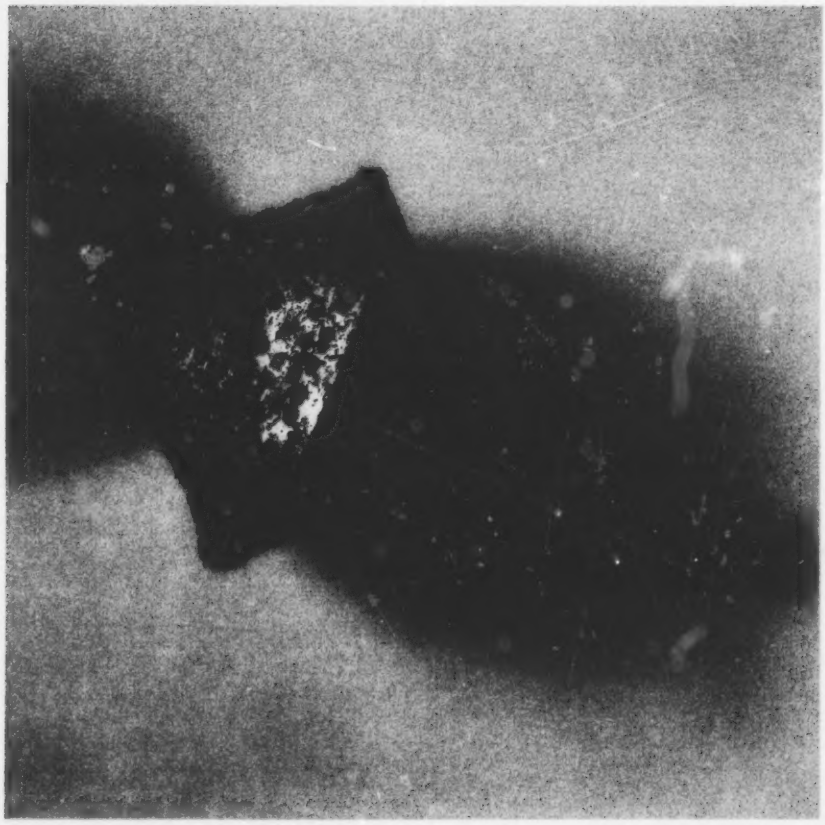
What did the 1771 icehouse look like when well stocked?
(Canadian Parks Service. Suzanne Duquet from a drawing by François Pellerin)

The ice reservoir.
(Canadian Parks Service, photo by Michel Elie)

Partial view of remains uncovered in the South-East courtyard of the Chateau.
(Canadian Parks Service, photo by Michel Elie)

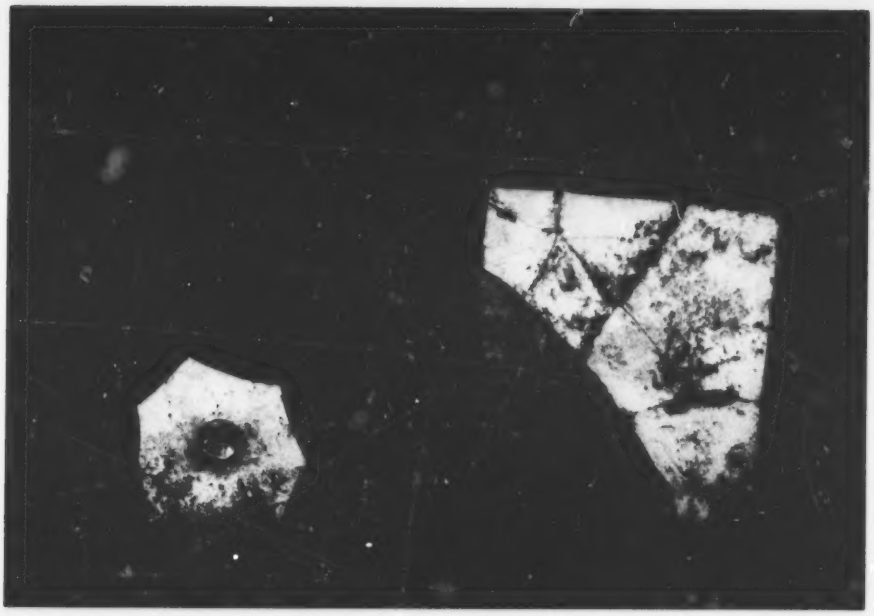


Stoneware jugs. The one on the right is of North American origin and the other two of British manufacture.
(Canadian Parks Service, photo by Jean Jolin)



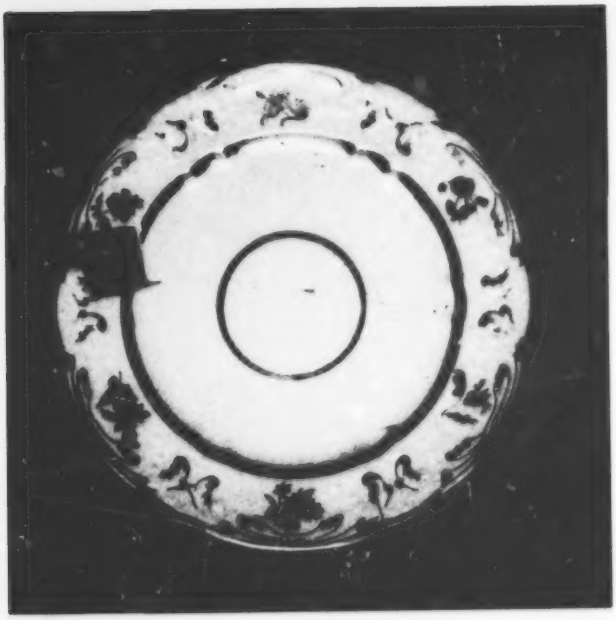
Sheet metal rose of a watering-can, found on the floor of the building adjoining the 1815 greenhouse.
(Canadian Parks Service, photo by Jean Jolin)

Artist's rendering of the 1781 greenhouse based on archaeological evidence and a Diderot illustration.
(Canadian Parks Service, Suzanne Duquet from a drawing by François Pellerin)



Window panes and flowers... of olden times.
(Canadian Parks Service, photo by Jean Jolin)

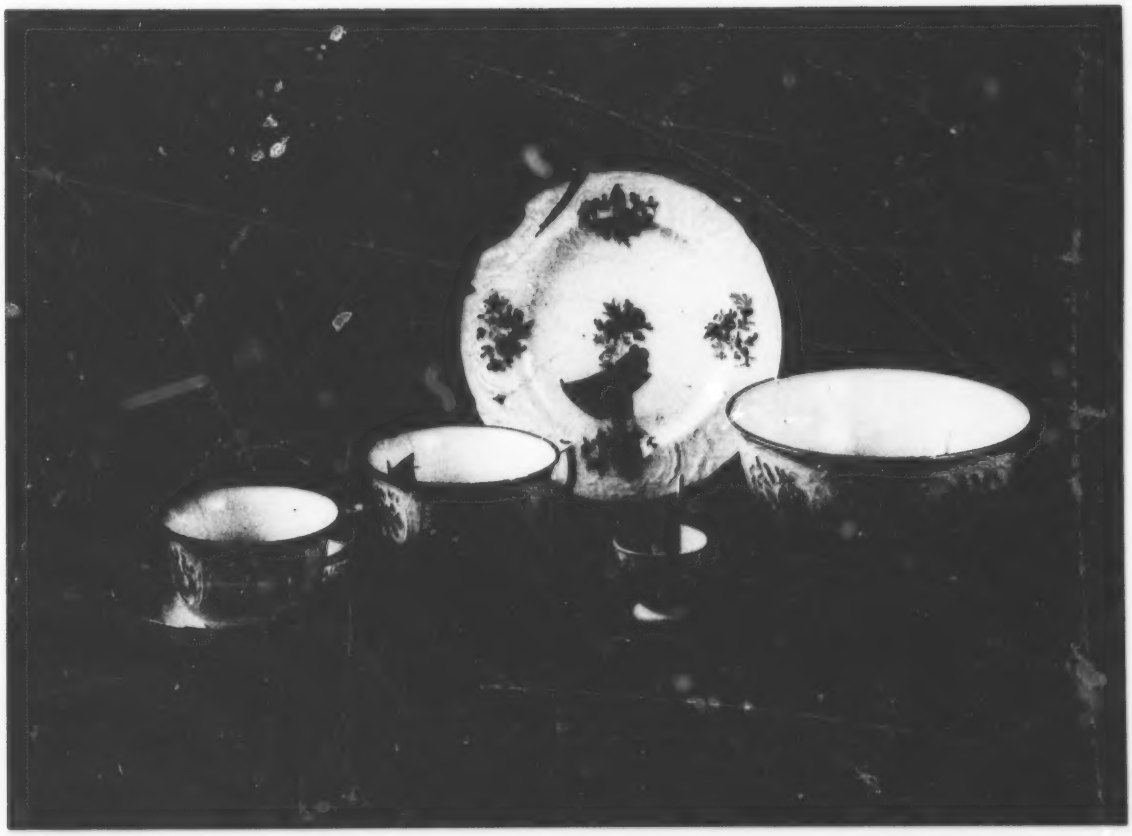
Flowerpots and saucers.
(Canadian Parks Service, photo by Jean Jolin)



"Top of the line" porcelain plates with molded and 24 carat gold decoration, of Viennese inspiration.
(Canadian Parks Service, photo by Jean Jolin)

Porcelain plate rims with decorations enriched with gilding.
(Canadian Parks Service, photo by Jean Jolin)

From left to right: Champagne bottle, stoneware beer bottle and wine bottle.
(Canadian Parks Service, photo by Jean Jolin)



Painted English porcelain breakfast service of good quality (Meissen copy).

(Canadian Parks Service, photo by Jean Jolin)

Decanters of the Anglo-Irish period (1780-1825).
(Canadian Parks Service, photo by Jean Jolin)

Tableware with minimal decoration. Front: cylindrical cup and bowl in slip decorated refined white earthenware; rear: shell-edge decorated pearlware plate, and sponge decorated cup and saucer.

(Canadian Parks Service, photo by Jean Jolin)

Hand painted pearlware cup and saucer.

(Canadian Parks Service, photo by Jean Jolin)

From left to right, top: Choke-Cherry (*Prunus virginiana* L.), Hawthorn (*Crataegus* sp.); bottom: Red-berried Elder (*Sambucus pubens Michx.*), Bunchberry (*Cornus canadensis* L.).

(Photo by Yves Boudreault)

Chapter 3

THE GARDENS AND GREENHOUSES OF THE GOVERNORS IN QUÉBEC

Roxane Renaud

During the archaeological excavations carried out under the Dufferin Terrace, one of our mandates was to continue research on the Governors' gardens and find the remains of greenhouses built in the southeast courtyard of the Château Saint-Louis in the 18th and 19th centuries. The following chapter presents the results of this research and expands upon the horticultural activities pursued by the Governors or their contemporaries.

Firstly, we will review the history of the upper and lower Governors' gardens in Québec. Secondly, based on the identification of plant macro-remains found on the site, we will examine the types of plants grown in these gardens of yesteryear. It is essential to begin the section dealing with the greenhouses of the Château by considering of the basic elements that have governed the art of building these structures since the beginning, especially in France and Great Britain. This involves, in particular, a discussion of the light, heat, water, and food required for the survival not only of people and animals, but also that of plants. The next section contains a few observations on Québec's climate, whose effects may be assuaged by the construction of greenhouses. Finally, there is a discussion of the archaeological remains, which, even today, bear witness to how horticultural practices have been adapted to the climate prevailing at the top of Cap Diamant. This will be accompanied by a history of the structures since they first appeared in 1779, until they were demolished in 1854.

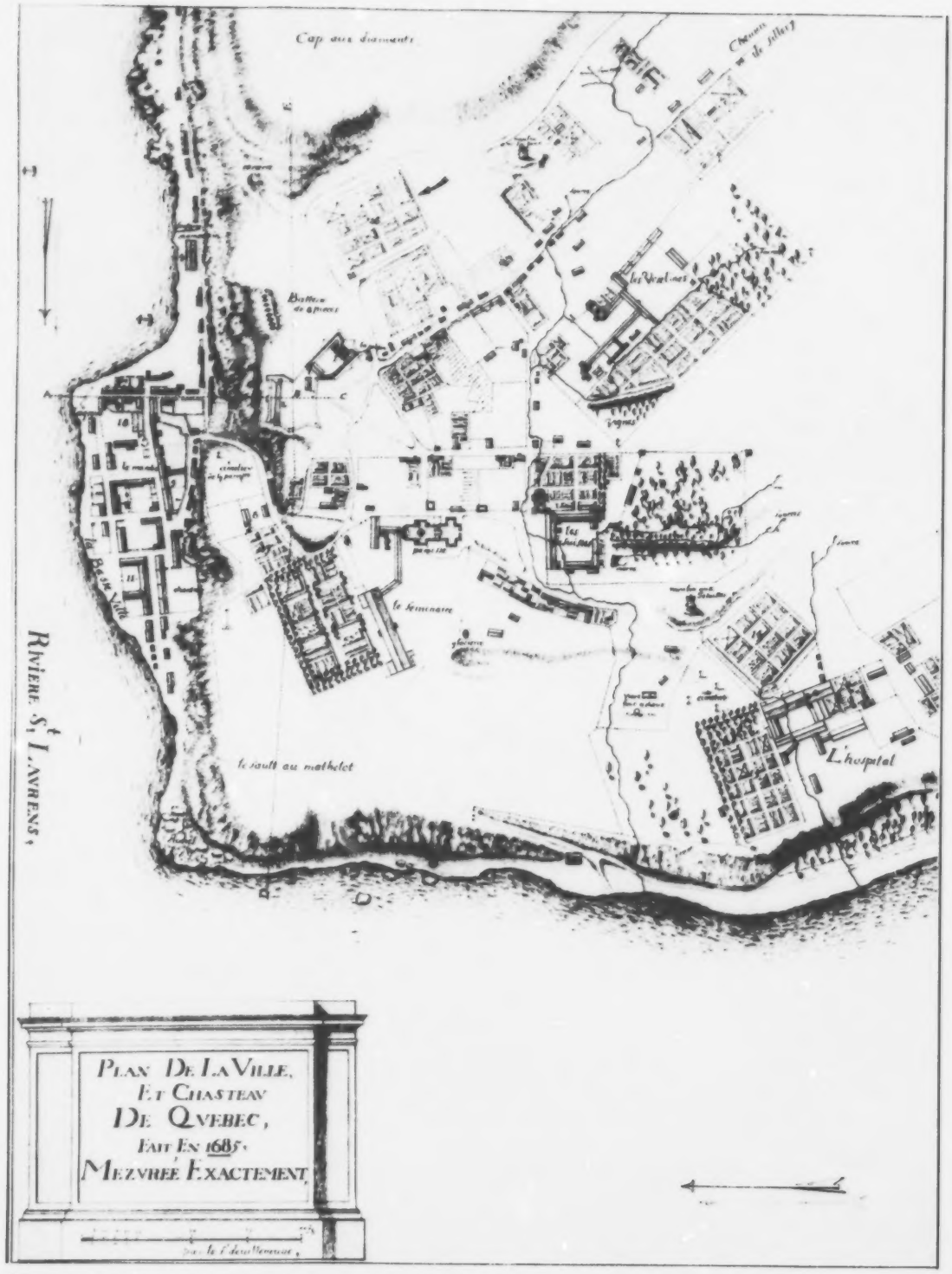
THE GARDENS

The *jardin des Gouverneurs*, An Historic Garden?

> *A historic garden is an architectural and horticultural composition of interest to the public from the historical and artistic point of view.*[1]

Starting with this definition, formulated in 1971, landscape specialists Buggey and Stuart consider that a garden is of historical interest if it is arranged in such a way that it can be regarded as a work of art, or if it is distinguished by a particular style, has been designed by a master landscape architect, or if it includes a collection that is of particular interest to botanists. A garden will also be considered of interest if its ecological impacts improve the environment where it is found, or if it is associated with historically significant events or people.[2] Most Canadian historical gardens have been classified as such on the basis of their picturesque so-called "English" style, and the fame of their owners or the gardeners who designed and maintained them. This is the case, for example, with the Sillery villas.

However, the *jardin des Gouverneurs* in Québec City is important for other reasons. Above all, it is one of the oldest gardens in North America, as it was already illustrated on plans of the city drawn in 1660. It is similar to European monastic gardens of the middle ages, a style that was favoured by the



3.1 Plan showing the convent gardens of the City of Québec in 1685. The Governor's garden is indicated by an arrow.
(Plan De La Ville et Chasteau De Quebec, fait en 1685 Mezurée Exactement, par le Sr de villeneuve; National Archives of Canada; C-15797)

religious communities in Québec and Montréal at the beginnings of the colony (Fig. 3.1). Its privileged location, quite close to the residence of the Governors (the Château Saint-Louis and later the Château Haldimand), means that the garden has been witness to many of our most important historical events. Both during the French regime and after the conquest of New France by England, the garden was regularly visited by illustrious figures; and were we to judge by the following excerpt from one of Lady Aylmer's letters, it formed integral part of their daily lives: "I have ridden twice a day generally during the last part of the winter in the garden where the terraces have been kept from the snow, and I have generally found it even pleasant."[3] Slowly converted to the "English" style during the 19th century, the Governor's garden became in the 20th century, a sort of square that, by the symmetry of its pathways and rows of trees, is again reminiscent of the way it was first laid out as a formal French garden. Today, it represents not only a historical treasure, but also an oasis of greenery and peace for the residents of a neighbourhood where tourist attractions abound. Let us now attempt to retrace the history of the garden through the words of those who kept them and visited them.

The History of the Upper Garden

When Champlain completed the construction of his first settlement in Québec's lower town at the beginning of the colony, he had already planted around the building very "good" gardens.[4] Later, when Governor Montmagny settled at the top of Cap Diamant, he set aside a space for herbs and vegetables. On the old maps, the space is called the Fort Garden or the Governor's Garden. It was located more or less in the same place as it is today, between the present Carrières, Sainte-Geneviève, Laporte, and Mont-Carmel streets. The size has not changed significantly, and its general appearance has remained the same since the beginning of the 19th century.

On the iconographic documents, the garden is drawn in accordance with a rigorous plan of square and rectangular shapes divided by straight pathways crossing at right angles. This arrangement has varied slightly

3.2 The Wolfe and Montcalm Monument in the Upper Garden, during the first half of the 19th century. Note the presence of gardeners and their tools.
(Archives nationales du Québec à Québec, Collection Initiale: P600 6/216)

with the years; but, in general, the organization of the beds and pathways is indicative of an utilitarian, rather than an ornamental, function. At the beginning of the 18th century, some city plans show rows of trees to the south and west of the garden.[5] This was the only significant change made before the Conquest.

Like other monastic or secular gardens of the time, the Governor's garden had to be enclosed, in order to ensure the privacy of the owners, and discourage eventual predators. At the Château, the enclosure consisted of a palisade made of cedar posts eight French feet high set side by side over footings.[6] In 1665, bastions were built on the corners of this enclosure, which were reminiscent of the fort located close by.[7] In 1733, the locks for the doors into the garden and the gardener's house were repaired;[8] however, their location is not known. Toward the end of the French regime, the palisade was replaced by a solid wall,[9] but no further indications are given as to what materials were used. At that time, the garden underwent slight modifications: although it retained its geometrical arrangement, only two large sections remained. One would have been used for utilitarian purposes, and the other for ornamental use.[10]

In the years after the Conquest, the Governor's garden retained its style and a house for the gardener was added. It was at this time that the Lower Garden was opened in the east side of Carrières Street.[11] In 1815, in the words of Joseph Bouchette, these green spaces were still "a most excellent and well stocked garden."[12] Later, in 1827, under Dalhousie's administration, the famous monument to Wolfe and Montcalm, which the artist, Cockburn, placed in a setting of trees and shrubs (Fig. 3.2), was built in the Upper Garden. From then on, people could stroll in the Monument or Government Garden,[13] which was opened to the public by Lord Durham in 1838. In 1845, responsibility for the maintenance of the gardens was entrusted to the City of Québec, which had already been legally incorporated for some ten years.[14] At that time, the gardener, Richard Clancy, was put in charge of the following tasks:

> *[...] Entretenir durant les saisons convenables, les places de promenade et les allées [...] nettes et en bon ordre [...] faire et entretenir des plates bandes à fleurs [...] sur chaque côté des dites allées [...] tenir en bon ordre tous les arbres, arbrisseaux et plantes [...], sans pouvoir en couper ni arracher aucun [...] entretenir en bon état de culture les parties [...] qui ont coûté d'être cultivées, notamment celles qui jusqu'à ce jour ont été employées comme jardins potagers [...] veiller soigneusement à ce qu'aucunes personnes [sic] visitant les dits jardins ne fassent aucuns dommages aux arbres, arbrisseaux, plantes ou autres objets dépendans des dits jardins [...] de se conformer à tous les ordres, Règles et Reglemens qui pourront être donnés et faits par la dite Corporation [...] [qui] accorde en outre au dit Richard Clancy tous les fruits des dits jardins durant la dite année, tant ceux provenans des arbres fruitiers que ceux provenans des jardins potagers.*[15]

Unfortunately, despite all these precautions, a complaint was sent two years later to the city's mayor to deplore (more than a century ago!) that trees had been cut and that the diamond and wheel-shaped floral borders had been damaged:

> *A number of the residents in the vicinity being greatly distressed to see a beautiful garden thus wantonly destroyed and mutilated, have desired me to call the attention of the Corporation to this subject, and to request that the management of the garden may be put under the surveillance of persons who will for the future prevent a recurrence.*[16]

Between 1854 and 1880, the iconography still shows the garden enclosed by a low stone wall topped with a metal railing.[17] The Wolfe and Montcalm monument was refurbished in 1868 and, in 1884, the low wall was rebuilt, but without the railing. Four years later, an octagonal tool shed reminiscent of the kiosks on the Dufferin Terrace was installed in the garden.[18] Today, the garden is still surrounded by a stone wall pierced by many openings to facilitate access. The pathways (which have unfortunately been covered with asphalt) and the arrangement of the elms and maples recall the geometrical style of the early garden. The secondary paths converge toward the monument, that offers the focal point characteristic of formal gardens of the French Renaissance. Contrary to convent gardens still in place in Québec, which are only visible from the air, the Governor's garden remains an open space that offers interesting perspectives on all sides. Lovers of open-air spectacles linger there during the summer festivals, and strollers enjoy a walk in the garden in all seasons of the year, both in good and bad weather.

The Lower Garden: A Quite Different Story

Throughout the French regime, the land located to the east of Carrières Street was used only for military purposes. It was there that the Governors' cannons took their stand. In 1766, part of this land was transferred by Murray to Major Samuel Holland upon two conditions: on the one hand, Holland had to pay an annual rent; and on the other, the government could regain possession of the land as long as they paid proper compensation. In 1779, when Governor Haldimand wanted to buy it back to install the Wolfe battery, a garden had already been made in that location. In fact, preparations had started the year before, when some rocks had been blasted and the land had been enclosed with a stone wall.[19] Apart from the garden, Haldimand also bought the Parisian house located at the southern end of the Lower Garden, for its well (Fig. 3.4) "to obtain water for the use of the garden";[20] the remains of the well were located and excavated during our 1981 archaeological campaign.[21]

The successive arrangements of the Lower Garden are known through the accounts covering various works that were carried out: a stone wall was built behind the Wolfe Battery, a fence erected along the southern edge of the garden, a drain installed on the northwest corner of the enclosure, and a road bordered by a long wall was constructed from the Citadel to the Château. In 1784, a wall topped by a wooden bannister, as well as a sidewalk, were built along the garden and, during the following year, stepped beds were arranged to grow strawberries.[22] Until the 1820s, most of the works carried out in the Lower Garden consisted of repairs to the wall, gate and well. However, they also included covering some areas with gravel, and the construction of drains, fences, flower boxes, and water tanks. The documents also mention the presence of new buildings identified as a summer house and a root house; however, these do not appear on any known plans of the time.[23]

In 1827, when plans were made to build the Wolfe and Montcalm monument, the proposed location was the Place d'Armes; however, for unknown reasons, the first stone was laid in the Lower Garden. This choice was not at all to the taste of the general public, and the following outburst published in the *Gazette de Québec* of the same day surely contributed to the decision to change the site and build the monument in the Upper Garden:

3.3 View of the Lower Garden in 1833. The greenhouse was built at the end of the garden in 1815.
(View of the Lower City of Québec from the Parapet of the Upper City, J.P. Cockburn; Musée du Québec, photo: Patrick Altman; G 53.106 E[2]1, detail)

En voyant ce matin, la cérémonie qui a eu lieu à l'occasion du monument que l'on élève à Wolfe et Montcalm, j'ai songé comme suit: Si par une figure de rhétorique Wolfe et Montcalm revenaient en ce monde, ne diraient-ils pas: "Hélas, vanité des vanités! nous espérions une place parmi les héros et l'on a fait de nous, en Canada, des admirateurs de patates, des planteurs de choux, et des garde-légumes dans le potager du gouverneur.[24]

When an extension to the Durham Terrace was built in 1854, the future of the Lower Garden was described as follows:

Cette partie du jardin, qui serait aussi occupée par la promenade, et qui ressemble plus à une tranchée qu'à autre chose, est à peu près d'aucune utilité [sic], et dépare réellement par sa nudité le beau jardin du Fort. En prolongeant ainsi la promenade entre deux balustrades, l'une correspondante au fleuve, l'autre au jardin, le promeneur aurait d'un côté, la majestueuse vue du fleuve, et de l'autre, la douce odeur des fleurs et des arbres et l'agréable vue du jardin.[25]

The Terrace was only extended by 68 feet. In 1856, when the École Normale was opened in the Château Haldimand, part of the Lower Garden was transformed into a botanical garden. In spite of improvements, the site still had its problems, since the following year, complaints were made about indecent acts committed there, and the annoyance caused to the neighbourhood. In 1860, a request was sent to the Public Works Officer asking that the Lower Garden be opened to the public. The garden, however, was only made public 16 years later, shortly before it retreated under the shadow of the Dufferin Terrace.[26]

3.4 The well of the Parisien house found during the 1981 archaeological excavations.
(Canadian Parks Service, photo: Michel Elie: 38G81R74X-3)

Bringing the Countryside to Town

During the 1982 and 1987 archaeological excavations, samples of soil were obtained in the Lower Garden and sent to a botanical laboratory, in order to identify any seeds present (Table 1). The first time, the samples were obtained from various levels dating from the second half of the 18th century until the construction of the Dufferin Terrace in 1878. In order to identify these levels, the archaeologists used stratigraphic indices and artifacts found in the pertinent layers. The results of the plant analysis suggested that, by the second half of the 18th century, the trees had already been removed from the Lower Garden: no tree species were found in the samples. They contained mostly specimens of weeds identified by Marie-Victorin as those that invade vacant fields and cultivated plots, and included mainly Caryophyllaceae and Euphorbiaceae (*Euphorbia helioscopia*) plants. The presence of edible plants on the site was demonstrated by the identification of wheat and elderberry seeds. According to the archaeologist William Moss, part of the garden may have been periodically burnbeat, since the wheat seeds had been carbonized.[27]

At the end of the 18th century, when the first hotbeds and hot-house were installed on the site of the Lower Garden, the iconographic sources show that it looked like a well-tended field. However, macro-remains obtained from this layer show mostly weeds, and shrubs that bear edible fruits that can be gathered. These include mainly raspberries, elderberries, and bird-cherries.

The macro-remains from the 19th-century occupation layers were not very revealing in terms of the arrangement of the Lower Garden. In the site of the botanical gardens of the École Normale, there were only a few weeds, which could be indicative of regular weeding activities and good maintenance of the plots. Elsewhere in the Lower Garden, the samples revealed the presence of raspberry, elderberry, and bird-cherry bushes that can grow in the natural state. Domestic plants were almost totally absent from the samples, since only a few strawberry, buckwheat, and wheat seeds were found. A few leaves and roots found in the rubble testify to the presence of trees on the site during the period immediately before the

construction of the terrace. They included hickory, chestnut, elm, and poplar. None of the samples obtained in 1982 contained any evidence of ornamental plants in the Lower Garden.[28]

The study of some 7,000 seeds collected during the reconstruction works carried out in 1987 made it possible to identify 45 taxons. At that time, the excavation effort was concentrated a few metres away from the remains of the Château greenhouses and in layers dating from the end of the 18th century. These contained numerous species, most of which were again representative of weeds, including purslane, mustard, goosefoot, yellow dock, green amaranth, and common chickweed. Most of these non-edible plants were introduced from Eurasia and grow in all

Identification and Quantities by Taxon of Macro-remains Derived from Samples Obtained in the Lower Garden, in 1982 and 1987

Name of Plants and Fruits		1987	1982
■ **Edible**			
CULTIVATED:	fig (*Ficus carica* L.)	50	
	Damson plum (*Prunus domestica* L.)	1	
	grape (*Vitis* sp.)	4	
	wheat (*Triticum aestivum*)		144
WILD:	spikenard (*Aralia racemosa* L.)	1	2
	hawthorn (*Crataegus* sp.)	1	
	strawberry (*Fragaria* sp.)[1]	291	1
	raspberry (*Rubus idaeus* L.)[1]	436	98
	bird-cherry (*Prunus pensylvanica* L.f.)	10	11
	choke-cherry (*Prunus virginiana* L.)	4	
	elderberry (*Sambucus* sp.)	14	174
■ **Non-Edible**			
INDIGENOUS:	spike-rush (*Eleocharis* sp.)[2]	1	
	hairy spurge (*Euphorbia vermiculata* Raf.)[2]	24	
	rough cinquefoil (*Potentilla norvegica* L.)[2]	9	
INTRODUCED:	green amaranth (*Amaranthus retroflexus* L.)	158	
	common burdock (*Arctium minus* (Hill) Bernh.)	5	
	mustard (*Brassica* sp.)	1,523	86
	hemp (*Cannabis sativa* L.)	1	
	sedge (*Carex* sp.)	2	
	goosefoot (*Chenopodium* sp.)	1,124	257
	wartweed (*Euphorbia helioscopia* L.)	2	36
	henbane (*Hyoscyamus niger* L.)	12	
	yellow wood-sorrel (*Oxalis stricta* L.)	1	
	old-witch grass (*Panicum capillare* L.)	3	
	knotweed (*Polygonum aviculare* L.)	43	
	black bindweed (*Polygonum convolvulus* L.)	3	
	pinkweed (*Polygonum pensylvanicum* L.)	10	
	lady's thumb (*Polygonum persicaria* L.)	29	
	purslane (*Portulaca oleracea* L.)	2,502	3
	creeping buttercup (*Ranunculus repens* L.)	6	
	sheep sorrel (*Rumex acetosella*)	10	
	yellow dock (*Rumex crispus* L.)	519	37
	bladder campion (*Silene cucubalus* Wibel)	9	52
	corn-spurrey (*Spergula arvensis* L.)	1	
	common chickweed (*Stellaria media* (L.) Cyrillo)	107	

1 may have been cultivated
2 may have been introduced

Table 1

types of habitats frequented by human beings, in gardens and cultivated fields, as well as in the proximity of roads and houses. Edible plants, such as strawberry and raspberry, were very plentiful, and may have been cultivated on the site. However, these small fruits may also have come from town markets, or be the result of gathering wild species. This is also the case with less abundant taxa, including elderberry, spikenard, hawthorn, bird-cherry, and choke-cherry, which could have been easily collected in the Québec region at that time. As far as grapes and Damson plums are concerned, it is possible that they may have taken root on the site. However, as in the case of figs, these cultivated plants may have been grown in the greenhouses or imported from countries with milder climates.[29]

Several hypotheses have been formulated respecting the crops grown in the Lower Garden, as there is no clear evidence that the taxa identified actually grew on this site. We may take into consideration the scarcity or lack of some species that can sometimes provide certain clues. For example, the results described above confirm the lack of ornamental plants on the site, but we may assume, by the nature and quantity of certain species, that small fruit species were cultivated. We know what the Lower Garden looked like, at least at certain times, when many trees, shrubs, and weeds grew there bringing a certain country air to this corner of the town (Fig. 3.5).

A systematic investigation of the macro-remains in the unexcavated sections of the Lower Garden would certainly allow archaeologists to complete the picture and increase their understanding of the former flora.

Even though the results of these explorations are somewhat scanty, the opposite is true in terms of the greenhouses, these indoor gardens, well protected from the inclemency of the weather, that appeared in the vicinity of the Château toward the end of the 18th century.

3.5 View of the Lower Garden after 1857, by A. Henderson. (Notman Photographic Archives, McCord Museum, McGill University: MP 1452 [100] A)

THE GREENHOUSES: A LITTLE HISTORY AND KNOW-HOW

Of Their Origin and Function

Greenhouses were born of the need to place plants in conditions similar to those in their original habitats in terms of light, heat, humidity, and type of soil. Early gardeners observed that, often, in the various regions of their own country, the amount of sunlight and the climate would affect the growth, flowering, fruit-bearing capacity, and yield of plants. During the first acclimatization attempts, they also discovered that it was much more difficult to keep plants that came from warm regions during the local winters. It seems that the Romans were the first to build temporary greenhouses that took the shape of frameworks covered

with thin sheets of mica or other silicious materials. It was only during the first century after Christ that glass was first used for architectural purposes, and at that time, it was only found in the houses of the most privileged classes. In Pompeii, a permanent greenhouse, known as the specularia (from the Latin *speculum*: mirror) was found: the front face of the building was made of either glass or glass-substitutes, such as mica and talc. A system of pipes running inside the other walls was used to supply heat, and the plants were placed on masonry shelves inside the greenhouse.

In Europe, greenhouse architecture developed due to the popularity of orange and lemon, exotic fruits introduced as the result of expeditions to warmer countries. These greenhouses were more or less effective temporary structures that were dismantled in clement weather and put back together as needed during the cold season. In France, these structures were known as *orangeries* or *citronnières* (orange or lemon houses) and they became permanent when it was found that it was simpler to carry fruit trees in and out, according to the climatic conditions outside.[30] In the winter, the plants were put away in these masonry buildings equipped with a few windows. The French word *serre* which is in general use even today, was derived from the verb *serrer*, which means to house or store away.[31]

In the 17th century, the development of various techniques made it possible to improve considerably the performance of these *orangeries*. In 1619, the Germans were the first to use glass windows on the side most exposed to the sun. The British used the same construction technique for the roof of their orangeries or conservatories toward the end of the century. In Holland, the Dutch were the first to use a *feu fermé* heating system, which can control humidity better and evacuate outside the smoke that is so damaging to plants. Little by little, the functions of greenhouses became more clearly defined, and the terminology became more complex, depending upon the country. In Great Britain, terms such as vinery, pinery, peach house, conservatory, and winter garden were added to others such as green-house and hot-house, which were already well established, and whose meanings vary depending upon the place and time. In France, hot-houses could be dry or wet depending upon the plants grown: in the 19th century, the roof was made so that its slope would correspond to the needs.[32] However, this was not the case at the very beginning of the previous century, when the slope of the southern face of the roof went from the horizontal to the vertical, without taking into account the types of plants inside. The terminology and architectural variants of these greenhouses became so complex in Europe during the second half of the 19th century, that we are well advised not to dwell here upon this subject. Rather, let us discuss in more detail the basic principles that governed the construction of greenhouses in Europe, especially in Great Britain, at the end of the 18th century, and during the first quarter of the 19th century. This should be enough to allow us to characterize the greenhouses built during the English regime at the Château Saint-Louis.

Of Light...

This basic element, so necessary for the good performance of all greenhouses, considerably influenced their architecture. Before the tax on glass was abolished in 1845, it had been sometimes necessary to help nature by covering the surface of the inside walls of the greenhouses with white plaster: "[...] for more light on dull days, it was recommended to paint the back walls white, or glaze them with white tiles."[33] Various means were used to bring as much light as possible into the building, and the simplest of these was the orientation of the structure itself. The ideal was to align the greenhouse along an east-west axis so that the main glazed wall would face south, and if possible to glaze the short sides. Blondel, a well-known French architect of the 18th century, explains that greenhouses should be glazed as follows:

> *Les plus grands carreaux de verre font les meilleurs pour le vitraux, parce que recevant plus de rayons du Soleil, la chaleur d'une ferre en eſt augmentée: les chaſſis des ferres à fruits ne s'ouvrent qu'avec des couplets, mais les autres dans leur partie ſupérieure s'ouvrent à couliſſes: les carreaux de ces derniers ſont ſoutenus, du moins en Angleterre, ſur les côtés, par des tringles de fer, & ſuivant la hauteur du rampant à recouvrement; le tout bien maſtiqué, afin d'empêcher l'humidité de pénétrer: l'uſage est encore dans ce pays, de couvrir les vitraux pendant la nuit.*[34]

The roof could also be glazed and sloped in such a way as to catch as much light as possible:

> *[...] It admits the sun's rays to pass perpendicularly through the roof during the two seasons of the year when they are most wanted [...] April for perfecting blossoms and in autumn for maturing fruits, and ripening young shoots.*[35]

...and of Heat

Locating the greenhouse properly helps to bring light into the building and also to conserve heat. A buffer space provided to the north of the greenhouse, such as a thick wall, another building, or an embankment would serve to protect the greenhouse from the dominant winds. Good exposure to the midday sun would make it possible to store enough energy without having to use other sources of heating, as is the case with cold and temperate greenhouses.

Additional heat may also be conserved on the basis of the architecture of the building itself. First, the building should be constructed over a rather high basement so that the humidity in the ground does not penetrate inside. The back wall should be thick enough to conserve heat. The door of the greenhouse should not open directly into the outside; but should open onto a vestibule or, even better, the room housing the heater.[36] Neumann considers that having a vestibule is absolutely necessary and that it should always contain the source of heat, regardless of the heating process used, as this will prevent the ashes and smoke that are so dangerous to plants, and outside air that can cause sudden changes of temperature, from getting into the greenhouse. In order to prevent excess dampness, the same author recommends that any masonry work for the greenhouse should be carried out in the spring rather than in the fall, so that the construction has time enough to dry, before it becomes necessary to close the greenhouse.[37] Also, the masonry should be of high enough quality not to require frequent repairs; because, of all the calamities that can affect a greenhouse, there is none to be feared more than the masons![38] Loss of heat, like excess heat from the sun's rays, may also be controlled by additional means, such as double windows or oiled paper, curtains, or wood panels that can help to keep fragile plants warm in winter and cool in summer.

All these measures have to do with the conservation of heat. Those that favour the production of the same element are more complex, but also essential in a country like ours. Heat may be derived from the fermentation or combustion of organic matter; and this naturally leads us into an examination of the heating systems used at the time under consideration:

> *[...] le fumier, la mousse, la tannée et autres matières fermenticibles [...] ne pouvant produire une chaleur permanente, on y a suppléé par des calorifères qui se sont compliqués ou perfectionnés avec le temps. D'abord c'était des poêles avec des tuyaux en terre ou en fonte, comme il en existe encore dans beaucoup d'établissements [...] Vint ensuite le thermosiphon, qui parait devoir persister, parce qu'au lieu d'une chaleur sèche et desséchante, [il] en produit une un peu plus humide [...].*[39]

This brief summary of the history of heating systems used in European greenhouses describes very accurately what happened in our own country.

According to all sources consulted, the arrangement and quality of these systems also deserve some attention. In England, at the end of the 18th century, if only one source of heat was used, it was located at one end of the building; however, if the greenhouse was long enough to require two, they were placed at the two ends, in order to provide heat throughout the entire length of the greenhouse and protect it from the outside air.[40] A little later, in France, heat was maintained under the greenhouse or outside the building using furnaces that sent in warm air through heating pipes or intakes set some distance apart. Heating the greenhouses with steam heaters was then the recommended procedure. It was thought that this was the best way, since heating with stoves had various disadvantages, including the fact that the air was too dry, and that the heat produced was not even.[41] In Loudon's opinion, this was not always the case: "Nothing can equal steam for heating an extensive range of hot-houses; but nothing [...] surpasses smoke flues for heating single houses, and especially green-houses."[42] Hot water heating systems using a thermosiphon, like those still used in the 20th century, will not be discussed here, because our greenhouses date from a time before their introduction in England and America in the 1830s:

> *The first British green-house installations were made in the early 1820s, and by the late 1830s a number of boiler systems were available commercially [...] until about 1850 hot-water heating in the United States was very much a luxury used in the hothouses and vineries of the rich.*[43]

Without Forgetting Watering...

Evidently, a source of water in the place where we want to make a garden is of primary importance. This may be obtained by natural or artificial means, from a spring, or well; but rain water must always take first place. Neumann even recommends the use of rain of storm showers and strongly advises against the use of well water which, in his words, "... est la plus mauvaise de toutes" because it is full of lime salts.[44] Others are of the same opinion, provided that the water is warmed up in the reservoir before it is used: this manna from heaven is collected in barrels placed under the roof gutters of the buildings and the precious liquid is taken either manually or through pipes to a cistern located inside the greenhouse.[45] In his course in architecture published in the 1770s, Blondel recommends this type of watering:

> *On doit placer dans une ferre un réservoir dans l'épaiffeur du mur, où l'on amène l'eau par un petit conduit, laquelle eau s'entretient par ce moyen au même degré de chaleur que celui de la ferre & fert à arrofer les plantes & les arbres.*[46]

The last operation consists of drawing the water in the tank using hand held watering cans similar to those used today.[47]

... and Fertilizers

In the 18th and 19th centuries, while chemical fertilizers such as those we use today were not yet on the market, good gardeners took advantage of natural resources available in their environment. These included the nitrogen, phosphorus, and potassium necessary for the best appearance of their protegees. Plant fertilizers could be found in garden waste, cut grass, and all parts of trees and plants. In this respect, Loudon recommends particularly the use of oak bark and leaves: "[...] they have the additional advantage that when perfectly rotten, like dung, they form a rich mould or excellent manure [...]."[48] Other organic fertilizers are provided by animal manure or human excrement, wood ash (for its potash), empty shells, dried blood, and bone meal (particularly fish meal, which is rich in phosphorus). Mineral fertilizers must be obtained from calcareous or saline substances, such as lime, which was the most frequently used in the past.[49] It is because gardeners need these materials for growing their plants, that we generally find that greenhouses are built near latrines, stables, and ash houses, that provide what they need.

THE CHATEAU GREENHOUSES: A VICTORY OVER THE CLIMATE

> *What do you think of my having, at this moment two bouquets consisting of Carnations, roses, Mignionette, &c, &c, on my table, before me? So you see we are not so deserving of pity in our cold Region. It is very certain that what we heard from some persons previous to our arrival is true. You see the Winter, but you do not feel it.*[50]

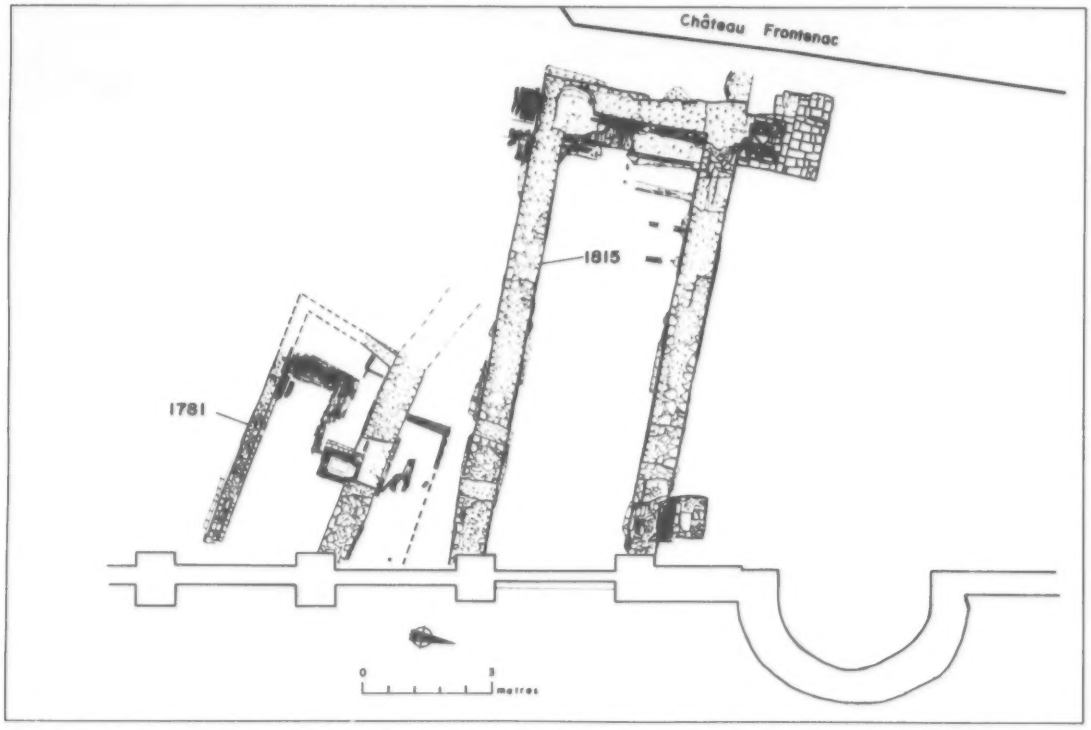
When Lady Aylmer wrote these words to one of her friends on 24 February 1831, she seemed to express the same sentiment felt by many of her compatriots that had come to live in Québec. Some twenty years before, John Lambert also pointed out that the winter in Lower Canada was no more arduous than in the fatherland, where house heating systems left a lot to be desired.[51] As human beings were able to withstand the Québec winters, keeping nice and warm inside their houses, the plants also had to be protected, in order to avoid the rigours of the climate, and survive the short springs:

> *[...] Hot-beds, as things of real use, are more necessary in America than in England [...] The American spring bears no resemblance to that of England, which comes on by degrees from*

the end of February to the beginning of June [...] In America there is in fact, no spring: there is a winter, a summer, and an autumn but no spring [...].[52]

Furthermore, in the middle of the 18th century, Pehr Kalm had pointed out that, in Montréal, the fruits arrived a week or more before Québec, because precipitation was less abundant and spring came sooner.[53] In the following century, John Lambert wrote upon the scantiness of fruit gardens in French Canada: "[...] except in the island of Montreal [...] [which] for its fertility in every production, may justly be called the garden of Lower Canada."[54] Even Loudon, in his famous treatise on horticulture, remarked upon this situation, and provided an explanation: "In climate, Quebec is very different to Montreal, the high grounds about the former city being more exposed to cold sea breeze than the level ground of the country of Montreal."[55]

We must, therefore, keep in mind the need to tame our climate when we deal with the methods used in the Château to grow plants under glass. Let us review the historical sources and archaeological remains (Fig. 3.6), in order to determine how the builders and gardeners of the time solved this problem, and were able to provide such amenities for the ladies of the Château.



3.6 Plan of the remains of the Governor's greenhouses, found during the 1985-1986 excavations.
(Canadian Parks Service, drawing: François Pellerin; 88-38G-D11)

The Beginnings

The history of cultivation under glass on the site of the Château Saint-Louis started rather modestly, at the time of Governor Haldimand, with the construction of hot-beds during the spring of 1779. As in the case of larger greenhouses, the authors get lost in the terminology, and there are many definitions of what exactly were hot-beds. In the case under consideration, we know they were no more than simple wooden frames, three large and two small, covered with a glazed framework.[56] On the basis of the materials mentioned, and the terms used in the account books of the Château, these hot-beds seem to correspond to the following definition found in an encyclopaedia of sciences, arts, and letters, published in the first half of the 19th century:

Les châssis sont la plus simple de toutes les serres: ils sont la transition naturelle de la cloche, simple ustensile de verre dont on recouvre les semis précoces, à ces édifices, véritables jardins d'Armide, où vivent les plantes des climats les plus chauds. On appelle châssis une caisse rectangulaire sans fond et couverte par un vitrage presqu'horizontal. Le châssis le plus répandu et en même temps le plus simple est en bois [...] et se pose sur des couches pour la culture des melons, des salades, de quelques légumes de primeur, et pour le semis des plantes d'ornement.[57]

The beds could be of different types and made up of different materials, depending upon the case. Generally, they contained a good thickness of horse manure that was covered with soil and exposed to the sun. In his encyclopaedia, Diderot distinguishes between hot, warm, and cold beds:

Celle qui vient d'être conftruite, & qui conferve toute fa chaleur dont on laiffe évaporer une partie en laiffant paffer huit jours fans y rien femer. Le doigt enfonçé dans la couche, fait juger de fa chaleur; & les fix à fept pouces de terreau dont on la couvre, font pour garantir de la vapeur du fumier les jeunes plantes qu'on y feme.[58]

In spite of their simplicity, hot-beds could be very useful, particularly in these regions. Full of admiration, Baroness de Riedesel, after spending some time in Québec with Governor Haldimand, said that even though he had been in Canada only three years, his vegetable garden was already full of foreign plants and fruits that one would not have expected to grow in this climate.[59]

1781: An Utilitarian Greenhouse

This first adaptation to the climate under the sky of the Château was followed by the construction of a hot-house in October 1781. The carpenter had to provide the following materials: wood planks and timber, nails of various kinds, fifty-eight pairs of hinges, and large quantities of glass for a hot-house that was to be built at the end of the Château's courtyard.[60] No iconographic document of the time shows the hot-house in question, except the Duberger model. A building with a lean-to roof is shown in the approximate location that we could interpret as the end of the Château's courtyard, inside the southeast bastion of Fort Saint-Louis. Written documents which provide information concerning repairs made to the buildings during subsequent years do not give any indication as to the orientation or shape of the structure. However, certain details can provide hints about its architecture. For instance, it was often necessary to repair the windows or install new frames, or to repaint or replaster some sections of the framework. The hardware, more precisely the locks, hooks, pegs, brackets, and bolts, had to be refurbished; the stoves and pipes had to be made ready, and water reservoirs had to be built for the purposes of the greenhouse or hot-house.[61]

Foreign fruits and plants took root in the hot-house during the months of winter, before they were planted in the kitchen garden. This was the only way to bring them to maturity outside during the good weather:

La chaleur de nos climats n'étant pas à beaucoup près affe confidérable pour les cultiver naturellement, on a tâché de diminuer la froidure de l'aire, & d'augmenter par art la chaleur des endroits où l'on vouloit élever ces fortes de plantes, pour fe rapprocher, autant que faire fe peut, de la température neceffaire à leur production. Les Hollandois & les Danois ont eu, pendant un tems [sic], la plus grande réputation, tans pour conftruire les ferres-chaudes, que pour les adminiftrer, mais aujourd'hui ce font les Anglois qui paffent pour furpaffer tous les autres.[62]

Hot-houses may be built in various ways. At that time, in England, there were two main types: one, where the plants were placed on shelves and heat was brought in using pipes under the floor or against the back wall; and the other that was heated more naturally using layers of oak bark or fresh manure in which the plant pots were placed.[63] To this point, on the basis of the mention of stoves and pipes, the documents consulted make it possible to place our hot-house in the first category. Let us now see what the remnants of the building can tell.

It was difficult to locate the hot-house during our first excavation campaign carried out in 1985 because the occupation levels were not touched at that time. We were only able to see that the enceinte of Fort Saint-Louis had been re-used, but were unable to determine for what purpose. During the following campaign, in 1986, we were able to clarify the use of the oldest remnants. The occupation levels were reached, and the specific function of the building was no longer open to doubt. It was located just to the

south of the left face of the southeast bastion of the Fort, and not inside the military structure as in the Duberger model. This location is much more logical because, in this way, the imposing escarp cannot prevent the midday sun from reaching into the hot-house. The wall would have protected it from northern winds and could have supported the thrust of a lean-to roof:

> *[...] Le mur de fond doit être très solide [...] car la façade de derrière est battue sans obstacle l'hiver par les vents du nord; si ce mur n'a pas une épaisseur suffisante, le froid peut pénétrer au travers dans l'orangerie [...] En Angleterre, on adosse souvent à l'orangerie, soit un hangar, soit même une construction fermée, qui contribue puissamment à empêcher le froid d'y pénétrer.*[64]

The heating system of the building consisted of a simple brick stove covered with a cast iron plate; it was placed on the threshold of the abandoned postern that had formerly been used to enter the bastion (Fig. 3.7). The stove was fed outside the hot-house from a small shed located on the north side of the scarp. It was possible to go from one building to the other using a narrow wooden door. The base and part of the framework of this door were unearthed just to the west of the stove.

The walls of the hot-house were only partly excavated during the archaeological excavations, but we were able to reveal a segment of the west wall. We assume that it formed an obtuse angle with the north wall, as if the builders had wanted to give the hot-house the shape of a parallelogram with unequal corners. The east wall, which was completely demolished during the construction of the Dufferin Terrace, and the junction of the south and west walls could not be exposed during the excavation. We can nevertheless estimate that the hot-house measured at least ten metres by four metres.

3.7 Remnants of the stove of the hot-house built in 1781. It was placed in a postern of the abandoned enceinte of Fort Saint-Louis.
(Canadian Parks Service, photo: Michel Élie; 38G85R59X-7)

The construction techniques used in the case of the south and west foundations were simple. The masons simply laid squared limestone blocks and rocks, and sometimes black shale, and held them together using mortar. The inside facing was plastered to the level of a pine floor, a few traces of which still remained. The outside face of the brick stove, as well as the inside facing of the north wall were also plastered, probably in order to reflect light better in the hot-house. The stove rested partly on a stone masonry base that was contiguous with the threshold of the postern.

As we have already mentioned, the stove was fed from a shed on the north side of the hot-house:

> *[...] La bouche des fourneaux, soit des serres chaudes, sèches ou de tan, soit des orangeries, doit s'ouvrir dans un hangar, pour y allumer le feu, afin de n'être pas obligé d'ouvrir les portes des serres à l'extérieur dans les temps froids.*[65]

The shed was also used to store the wood, and the tools and containers required for growing the plants. It was there that we found a large number of the plant pots and trays recovered during the excavations. The fragments rested at the level of the hot-house demolition layer, as well as on the wood floor of the shed:

> *A line of sheds is generally placed behind the range of hot-houses, or behind the hot-wall, or other high wall of the garden. These are used as stores, or places of reserve for utensils, machines, and implements, and for working-sheds.*[66]

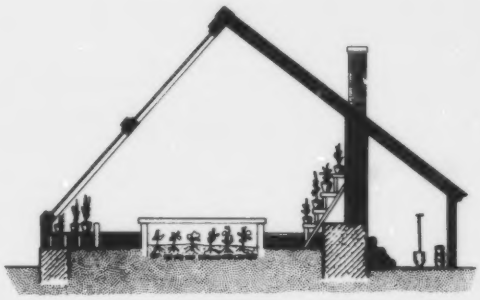
Remains found at the very end of the last excavation campaign made it possible for the researchers to obtain a better understanding of the interior arrangement and the type of hot-house found. This was a structure that, in its configuration and materials, was reminiscent of those rectangular installations known as forcing frames, that are used to grow seeds in the ground and under cover. Denis and Rouard defined them as follows:

> *Les bâches sont plus grandes que les châssis, mais elles en diffèrent en ce que leur caisse est ordinairement en maçonnerie, et que leur sol est plus bas que le sol extérieur. Pour la culture des primeurs, elle sera aussi au midi, mais plus enfonçée et chauffée par un poêle.*[67]

Our feature looked like a very organic soil layer enclosed by an alignment of cut sandstones set on edge. A large quantity of window glass fragments was also found at this level. A sample of soil obtained inside the box contained enormous amounts of plant and animal waste: tree leaves and bones, charcoal, and land molluscs belonging to species that are normally found in gardens. Lime pockets and cinders found in the waste, as well as the strong odour emanating from the site, were truly reminiscent of soil composting or improvement activities. In the second edition of his *Art de construire et de gouverner les serres*, Neumann recommended the use of the following materials in forcing frames: oak bark chips, horse manure, sawdust, tree leaves, oat bran, and woolly hair. He even goes as far as recommending that the forcing frames should be filled with cinders, gravel, and broken stones, in order to prevent the presence of insects, especially earthworms.[68]

The archaeological remains of the Château hothouse provide some indications of the internal arrangement of the building (Fig. 3.8). If we consider the time when the hot-house was built (1781), as well as the distribution of the remains found during the excavations, we may imagine that the building was a version of the bark hot-house for which plans and elevations are shown in Miller's *The Gardener's Dictionary*. This very simple hot-house is covered by a single sloping roof, with a lean-to added to the north side. Inside, we find the furnace and pipes, layers of bark, and the paths around the beds.[69] Our hot-house also corresponds to the plans for the so-called "Upsal" Dutch greenhouse that was so highly praised in Diderot's encyclopedia in the 18th century:[70]

Il faut en prendre des modèles fur celles de Hollande & d'Angleterre; car notre nation n'est pas encore affe éclairée fur ces fortes de bâtiments confacrés à l'avancement de la Botanique; nous aimons mieux des avenues éloignées, & des champs ftériles...[71]



3.8 Hypothetical reconstruction of the profile of the 1781 hothouse, from an illustration by Diderot and archaeological data.
(Canadian Parks Service, drawing: François Pellerin: 88-38G-D3)

1815: A Winter Garden

October 1816: A unpleasant day. It snowed and rained at intervale we went to church. I received the Sacrament. Sir John [Sherbrooke] and I walked in the green-house for an hour and half.[72]

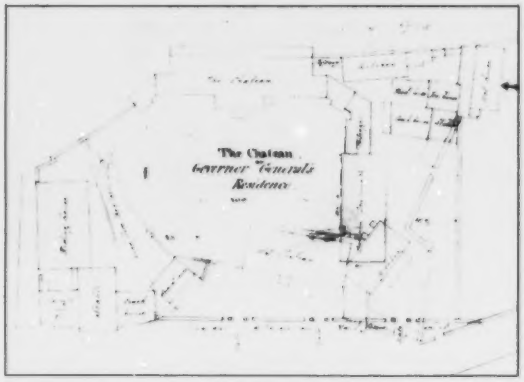
Lady Sherbrooke and her husband spent some pleasant moments in the new greenhouse, especially when the bad weather prevented them from walking on the balcony or in the garden. The same practice was established in Europe, where the greenhouse became a place of enjoyment, providing a promenade or refuge against the vagaries of the seasons, that could be arranged in such a way as to offer many pathways for walking, and places to rest.[73] Unfortunately, in her diary, Lady Sherbrooke does not give any details about the architecture of the greenhouse or the plants that were grown there. However, the iconography and the account books for the Château provide a few details.

The artists always show the greenhouse in the same location, in the shape of a building where the two sides of the roof meet at an angle of 90°. The

dimensions seem large, if we compare the structure to other neighbouring outbuildings (Fig. 3.10). The south face and occasionally the east face appear to be glazed. A porch is shown on the west side. Even though the accent is on the south face of the construction, it is possible to glimpse the presence of two chimneys on the north side (Fig. 3.9).

The foundations of the new greenhouse were built at the end of the summer in 1815, the work continued throughout the fall, and was completed in March 1816. In the account books of the Château, the building is identified as a hot-house or green-house;[74] there does not seem to be any notable difference between what is meant by these two terms. In this respect, in the 1830s, the Penny encyclopedia described the two buildings as follows:

> *Green-house and conservatories are commonly included in the appellation of hot-house. The only difference [...]: fires are seldom used in the green-house unless in very severe weather, while the hot-house is constantly kept at a high temperature; but so far as the building is concerned they may be considered as the same.*



3.10 Location of the greenhouse in 1827, by H. Pooley.
(National Archives of Canada: NMC-21,206, detail)

3.9 View toward the north of the greenhouse reconstructed in 1815 in the Lower Garden.
(The Château Saint-Louis and partial view of the lower town, circa 1818, artist anonymous; National Gallery of Canada, photo: Hans Blohm, Ottawa, 1978; 16,686)

As for their function the encyclopedia explains it as follows:

> *A green-house is for keeping and growing the plants of temperature (sic) countries [...] A hot-house is used for forcing fruits, or for growing plants which are indigeneous to tropical regions.*[75]

For his part, Loudon distinguishes between two types of greenhouses in his 1824 treatise: one "where the plants are to be grown in beds and borders"; and another, which he calls "green-house of pots," where the plants are removed during the summer.[76] The 1815 greenhouse probably belonged to the second type since, in a document dating from the following winter, there is a mention of "[...] completing the shed, making and fixing shelves in the hot-house."[77] There was no question of having hot beds and forcing frames, as in the case of the 1781 hot-house, but rather shelves on which pots were placed. These could thus be easily carried from the greenhouse to the Château for the enjoyment of the Governor and his guests.

Other information provided by the historical documents can add to our knowledge of the greenhouse. Apart from installing shelves on the inside, sliding panels were placed on the roof. Plants need not only light, heat, water, and fertilizer, but it is also necessary to renew the surrounding air. This is why it is of primary importance to build openable panels into the framework of the roof. According to Loudon, in this case, the most effective process is explained as follows:

> *The motion communicated to plants, by opening the cover, and exposing them to the direct influence of the air in fine weather, is deemed sufficient, either for this purpose, or for giving flavor to fruits when advancing to maturity.*[78]

On the other hand, he adds that:

> *[...] for a winter garden of pots [...]: it is a great consequence that there should be a power of opening the roof, as well as the south side and ends, to admit air to enter, circulate and escape, every mild day during the winter months. The common mode of effecting this in right-lined houses, is by having the roof and front composed of sashes which slide in grooves, and let down and open; or draw up and shut, at pleasure.*[79]

Apart from these sashes that make it so easy to air the building and control the temperature inside, "the general mode of renewing the air is by opening the doors."[80] This is the simplest way to do it; however, the winters in Québec are so severe that it is impossible to give the plants air in this way.

> *Il n'y a pas de meilleur moyen, pour renouveler au besoin l'air de la serre, que d'avoir un vestibule par lequel on puisse passer pour y entrer. Chaque fois qu'on entrera, ce vestibule se fournira d'air nouveau et, en ouvrant la porte qui donne dans la serre, cet air, se mêlant avec celui du dedans, qui est vicié par l'absorption des végéteaux, donnera à ce dernier les principes nécessaires à la végétation et à l'accroissement des plantes.*[81]

Finally, a porch was built and a cistern was installed on the west end of the building. According to Loudon, "[...] a cistern is frequently placed in the conservatory and devoted to the culture of aquatics."[82] In any case, it is necessary to have water tanks inside the greenhouse in order to water the plants.[83]

The 1815 greenhouse was demolished in 1854 at the same time as the other outbuildings of the Château Saint-Louis were taken down. The gardener, Richard Clancy, had already, some ten years before, deplored its advanced state of deterioration:

> *From the very decayed state of all the framing of the green-house, it is certain that the sashes will fall on this winter, if not removed, and I have to request instructions whether these sashes are to be taken down and stored away or as I think would be more advisable, to sell them...*[84]

The excavation of the building provided archaeologists with very substantial remains. Of imposing size, the infrastructure of the greenhouse covered the whole site located between the east and west supporting walls of the Dufferin Terrace, over a length of 19.75 metres, and a width of 7.95 metres. Trenches were dug in the soil to build masonry foundations on bedrock. The width of the foundations was 1.5 metres at the base. On the north side, the foundation was subsequently doubled to reach 2.5 metres thick. This footing supported on one side the framework of the north wall of the greenhouse, and on the other, the south wall of a shed that has been identified as the greenhouse lean-to. It was in this shed, wedged between the greenhouse and the icehouse, that the stove fires were maintained, and where the growing tools and utensils were probably stored. As far as these tools are concerned, several historical sources indicate that they were repaired and sometimes even made on the site.[85] There are mentions of shovels, wheelbarrows, spades, rollers, hoes, rakes, picks, axes, tamping tools, and even a tracing line.[86] The archaeological excavations revealed some of these objects, including a few shovels, one spade, one scythe, and one rake (Fig. 3.11); as well as a few fragments

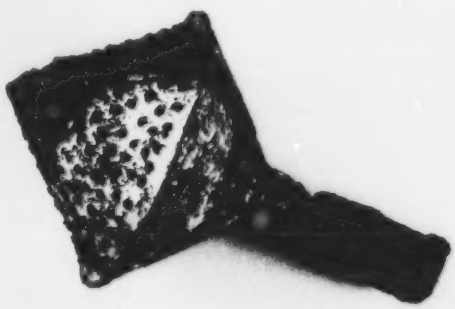
of watering cans with either a spray head or a spout (Fig. 3.12). In his encyclopedia, Diderot called these tools "arrosoirs à tête" and "arrosoirs à goulot."[87] Plant re-potting activities could also be carried out in this middle building, as well as some operations relating to composting. A study of the large quantities of fish bones found on the floor of this structure leads to several hypotheses. They could be indicative of the preparation and consumption of meals in the building, or could also be evidence of the use of fish bones as fertilizer for the Governor's greenhouses and gardens:

> *Although it is considered likely that the fish were the remains of a good meal, it is difficult to account for their deposition here as food waste. It seems more reasonable to suggest that they may have been stored here along with other food scraps to be used as compost or serve as pig feed [...] In preparation for the growing season, fish parts might also have been burned to produce bone ash which could have been used as fertilizer in the greenhouse or garden [...] It is also possible that fish may have been dry- or air-cured, or possibly smoked in this structure along with other meats [...] One final suggestion is that the fish, and other meats, may have been cut up, cooked, and consumed at this location with the bones being discarded in and around this structure.*[88]

In the site where the middle building and the greenhouse are located, the ground shows a marked variation in level. The lower footings of the structure were found on the bedrock, not very deep, at the west end of the greenhouse. On the other hand, in the east side, the remains were resting on wooden footings placed at the bottom of a construction trench at levels that could reach two metres deep. This construction technique explains the very irregular wall facing and mortar leaks found in the lower part of the foundations. The walls were made of limestone and shale with the addition of a few bricks and pieces of sandstone. In the upper part of the remains, the wall was occasionally faced with plaster. The arrangement of the materials had a more regular look, which distinguishes the foundations above the ground from the part that would have been buried, and which provides an idea about the differences in ground level at the time. The south side foundations of the building were not resting solely on bedrock or natural soil. In some locations, they were made over remnants of other buildings abandoned during the 18th century. In one case, they were built over the escarp of the right face of the southeast bastion of Fort Saint-Louis; while in another, they rested on a small rectangular building that has not yet been definitely identified (Fig. 3.13).

The discovery of traces of the greenhouse floor has made it possible to identify the occupation level at the west end of the building. The joists were oriented north-south, and the ends were resting on dressed sandstone blocks laid on bedrock or tamped earth, and planks were nailed over these beams crosswise. The objects found at this level bear witness to the specific function of the building. Window glass, fragments of plant pots, and assorted debris were strewn in large quantities over the remnants of the floor. In the east side of the greenhouse, the floor had been completely destroyed, probably during the demolition of the outbuildings in 1854. The cistern used to water the plants, the pipes used to heat the

3.11 These tools were found on the site of the Lower Garden and the Governor's greenhouses. From left to right: shovels, rake, scythe, and spade made of forged iron.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/D-68-3)



3.12 Sheet metal rose of a watering-can found on the floor of the building adjoining to the 1815 greenhouse.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-25)

building, as well as the shelves often mentioned in the historical documents, have left no trace in the greenhouse.

As far as heating is concerned, the discovery of two chimney footings outside the northern foundations of the greenhouse confirm what is shown on illustrations of the time. They are located at the east and west ends of the north wall of the structure, indicating that the hearth must have been fed from inside the lean-to. It was there that remains of a brick and mortar feature were found resting not on a wooden floor, as in the rest of the building, but on a sandstone pavement (Fig. 3.14). According to Miller, no wooden structures should be located near the furnace or the pipes because they would get so dry from exposure to continuous heat that they could easily catch fire.[89] The number of chimneys found was also to be expected, if we take into account the large size of the Château greenhouse:

> *On obferve de ne pas conduire la chaleur au-delà de neuf toifes de longueur, parce qu'alors elle deviendrait à rien au bout oppofé au fourneau, de forte que les plantes en fouffriroient. C'eft pourquoi, quand une ferre a plus de neuf à dix toifes de long, il faut la partager & pratiquer alors deux fourneaux, fi l'on veut, l'un à côté de l'autre avec des conduits, dont l'un échaufera la droite, & l'autre la gauche.*[90]

A *toise* (approximately one fathom) was equivalent to six French feet or about two metres. Our greenhouse measured eleven fathoms long, which justifies the use of two chimneys.

In England, the door to a greenhouse is always located at the east or west end of the building:

> *[...] La porte se place toujours sur un des côtés, à l'est ou à l'ouest [...] car il faut beaucoup d'espace pour que les chariots puissent tourner sans accident. Si la porte ouvrait sur l'une des deux façades, les chariots auraient trop de peine à circuler dans l'orangerie [...] Il faut lui choisir la situation la mieux abritée possible, mieux à l'ouest qu'à l'est [...]*[91]

At the Château, the iconography shows that the greenhouse was entered through a porch located at the west end. A masonry feature extending toward the west from the northwest corner of the greenhouse still testifies to its presence.

Since the greenhouse was demolished to the level of the floor and foundations, very little information could be obtained from the archaeological remains that would indicate the materials used for the framework. However, as one could have expected, large numbers of window glass fragments were found in the demolition layer, outside the southern section of the building (Fig. 3.15). The glass used varied in

3.13 General view of the remains of the greenhouse built over the earlier ruins of Fort Saint-Louis and of a building of unknown function.
(Canadian Parks Service, photo: Michel Élie; 38G86R126X-9)

3.14 Stone paving and chimney footing located in the building adjoining to the 1815 greenhouse.
(Canadian Parks Service, photo: Michel Élie; 38G85R44X-9)

colour from clear to light green. Most authors assert that, in England and Belgium, only sheets of very white glass especially made for glazing greenhouses were used.[92] Huxley is less categorical in this respect:

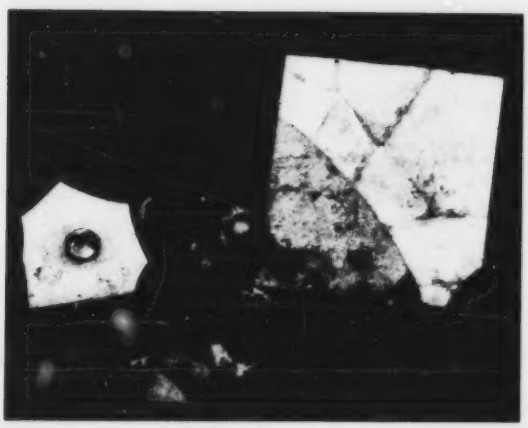
> *Theorizing then began on using glass tinted in various colors; some of the glasshouses at England's Kew Gardens were originally glazed with a pale yellowish green glass. In America, the theory that light filtered through blue was best for plant health gave rise to a craze for blue glass. However, it was soon found that clear glass was essential for healthy plant growth [...]*[93]

We do not know how the panes of glass in our greenhouse were assembled. But in England, at about the same time, they were laid in overlapping layers one over the other. They were generally put together with lead in order to prevent any rain leaks; they could also have been assembled using a glazier's putty consisting of a mastic made with white lead and linseed oil.[94]

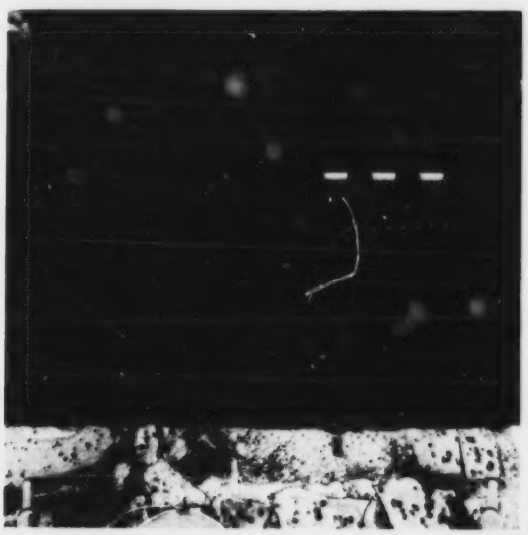
The illustrations and written documents of the time, and the debris found during the excavation provide a good idea about the materials used to roof the Château greenhouse. In an 1818 water colour showing the façade and south side of the building, the lower part of the roof is covered with a glazed framework and the upper part has an opaque covering (Fig. 3.9), which was probably also the case in the north side. According to an archival document dating from the fall of 1815, a tinsmith, Jacques Feluet, was paid "for covering part of the roof of the Hot-House with sheet tin."[95] Undoubtedly, this was for the opaque part of the roof, since a large quantity of fragments of sheet metal was found in the demolition debris in the surrounding area. A shutter that could be used to cover some of the glass during bad weather, or to protect the plants when the sun was too hot, was found outside the greenhouse (Fig. 3.16). It consists of four wooden panels connected by metal rods that could effectively correspond to one of the shutters mentioned in a document of the time: "[...] making and fixing [...] shutters and slides [...] to the roof [...]."[96]

Located at the southern end of the Château outbuildings, the greenhouse enjoyed good exposure to the sun. Its proximity to other service buildings would have certainly been an advantage for the gardener when carrying out some of his duties. For example, the nearby icehouse could well have been used to force spring bulbs such as tulips, hyacinths, and crocuses, and to store root vegetables.[97] The other outbuildings could have provided some of the materials necessary to fertilize the soil. Our gardener could have taken advantage of waste found in the woodshed, lye ashes in the laundry, potash in the ash house, and even the contents of the latrines:

> *Human urine contains a greater variety of constituents than any other species examined. Urea, uric acid [...] acetic acid, albumen, gelatine and various salts are found in it [...] The species of urine which contains most albumen, gelatine, and urea, are the best as manures [...] Night soil, it is well known, is a very powerful manure, and very liable to decompose [...].*[98]



3.15 Glass panes and flowers of yesteryear.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-168)



3.16 Remains of a shutter used for the 1815 greenhouse.
(Canadian Parks Service, photo: Michel Élie; 38G85R25X-11)

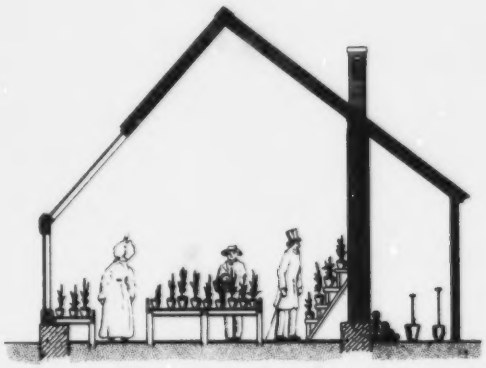
As in the case of the 1781 hot-house (Fig. 3.8), it is possible to imagine the interior arrangement of the greenhouse built in 1815 (Fig. 3.17). While the 1781 hot-house seemed similar to the rather modest bark hot-houses found in Europe at about the same time, that of 1815 is more comparable to the conservatories in the houses of quality built by the rich logging barons in the surroundings of Québec.[99] Its imposing size and external appearance, which are known from the iconographic documents, show that the greenhouse of the Château was not only an utilitarian building where seeds were planted in forcing frames in the spring, but also, a very attractive spot where the Governor and his wife, and sometimes their guests, could spend a few pleasant moments when the weather outside was not welcoming: "We walked in the green-house, the wind being easterly and too cold for the balcony."[100] We imagine an alignment of shelves separated by pathways that would allow for comfortable strolling while looking at the plants growing in the pots.

The historical documentation is scarce in terms of the plant species grown in the Governor's greenhouse. Nevertheless, we may assume that the latter appreciated the same products that were grown elsewhere in the greenhouses of other villas, during the 19th century:

> *Grâce aux habiles jardiniers que l'Angleterre et surtout l'Écosse nous a envoyés, nous pouvons admirer autour de Québec un genre de culture fort soigné, de riches conservatoires pour les fleurs tropicales [...], de vastes et belles serres-chaudes ou mûrissent sous le verre, le raisin le plus délectable, des pêches succulentes, de suaves nectarines (brugnons), des abricots, des bananes; des ananas d'un goût et d'un arôme exquis; des figues, etc., [...].*[101]

In the greenhouses of Spencer Wood, the gardener, P. Lowe, harvested pineapples, cucumbers, rhubarb, and even mushrooms for Christmas.[102] These structures are a good example of the quality of greenhouses for the time.

The study of past horticultural practices has recently attracted the interest of researchers and the general public. In North America, several historical gardens have been studied and restored, and this not without some considerable effort. As Audrey Noël Hume observed in the course of her research in Colonial Williamsburg, the archaeology of gardens is different from that of buildings, and requires more discernment on the part of the researchers. The remnants are very fragile, and their presence is often not very clear, while the objects that bear witness to horticultural activities are very difficult to date. Among other things, these objects include tools and plant containers whose manufacturing techniques have changed very little over the course of the years.



3.17 Reconstruction of the profile of the 1815 greenhouse on the basis of an illustration by C. Pessey.
(Canadian Parks Service, drawing: François Pellerin, 88-38G-D2)

Plants grown in the greenhouses of Spencer Wood between 1837 and 1849 (M.P. Lowe, in J.M. LeMoine, *Picturesque Quebec: A Sequel to Quebec Past and Present* [Montréal, Dawson Brothers, 1882], p. 335).

The hot-houses [...] consisted of pinery, stove and orchid house [...]. The following are the names of a few of the plants grown in the stove-house: – Ardisia; Alamanda; Amaryllis, Achimenes; Aschynanthus, Asclepias, Begonias, Crinums, Centradinias; Calumnias, Drymonias; Euphorbias, Franciscia; Goldfussia; Gesneras, in twelve varieties; Gloxinias, in twenty-four varieties; Gloriosa; Gardenias; Hibiscus; Inga; Ipomoea; Justicia; Lasiandra; Legastrema; Musa-Cavendishii [...]; Maranta; Melastomas, Mennetties; Nymphias; Osbeckias, Penteas, Passiflora; Peideum; Stephenotis, Strelitzias; Russelea; Ruellea; Rondilitia, Tabernaemonana; Tradescantia; Vinca; Clerodendrons, &c., &c [...].

The richness of the site under the Dufferin Terrace has made it possible to get a glimpse of the history of the gardens and greenhouses of the Château Saint-Louis in Québec. The Upper Garden has gone through a long evolution which took it from the French geometric style to that of the urban square we know today. At the beginnings of the colony, it was used mainly as a garden plot to meet the needs of the inhabitants of the Château Saint-Louis. In the 19th century, it became a public park, and its maintenance was entrusted to the City of Québec. The types of cultures both there and in the Lower Garden, which was established at the end of the 18th century to the east of Carrières Street, are known from documents of the time. The gardens contained foot paths and avenues, flower beds, shrubs, vegetables, and fruit trees. The study of plant macro-remains collected during the excavations of the Lower Garden has also contributed more precise information about the various cultivated or wild species that could be found there.

The remains discovered under the Dufferin Terrace have provided information not only on the gardens, but also on the greenhouses that for some sixty years sheltered the seedlings of the gardeners and ... the whims of the Governors. Finally, we have been able to examine a whole range of tools related to the culture of plants. Without the minute observation of the utilitarian flower pot and other utensils, so common but nevertheless so essential for horticultural endeavours even today, this foray into the garden would not be complete.

R. R. ■

NOTES AND REFERENCES • CHAPTER 3

1. John Stuart and Susan Buggey, "The Case for Commemoration of Historic Landscape," *Bulletin of the Association for Preservation Technology* (APT), Vol. VII, No. 2 (1975), p. 111, note 15.

2. *Ibid.*, p. 101.

3. L.A. Aylmer, 1831, "Recollections of Canada," *Rapport de l'archiviste de la province de Québec pour 1934-1935* (Québec, Rédempti Paradis, 1935), p. 318.

4. Denis Vaugeois and Jacques Lacoursière, *Canada-Québec: Synthèse historique* (Montréal, Renouveau Pédagogique, 1973), p. 53.

5. Jeannine Laurent and Jacques St-Pierre, *The Fort and Château Saint-Louis, 1620-1760*, Microfiche Report No. 40 (Parks Canada, Ottawa, 1982), p. 382.

6. *Ibid.*, p. 99.

7. *Ibid.*, p. 310.

8. *Ibid.*, p. 169.

9. *Ibid.*

10. *Ibid.*, p. 420.

11. Jacques Guimont (Ethnotech), *Étude sur l'évolution historique du secteur du Château Saint-Louis et de sa zone limitrophe de 1760 à 1838*, Microfiche Report No. 45 (Parks Canada, Ottawa, 1983), p. 292.

12. Joseph Bouchette, *A Topographical Description of the Province of Lower Canada With Remarks Upon Upper Canada and on the Relative Connexion of Both Provinces With The United States of America* (London, W. Faden, 1815), p. 434.

13. Jacques Guimont (Ethnotech), *op. cit.*, p. 352.

14. C. Chartré, J. Guimont, Y. Laframboise and G. Pelletier (Ethnotech), *Évolution historique de la terrasse Dufferin et sa zone limitrophe de 1838 à nos jours*, Microfiche Reports Nos. 29-30 (Parks Canada, Ottawa, 1981), p. 76.

15. Archives de la Ville de Québec (AVQ), Conseil et Comités, dossier parcs, 2 April 1845.

16. *Ibid.*, 5 March 1847.

17. C. Chartré, J. Guimont, Y. Laframboise and G. Pelletier (Ethnotech), *op. cit.*, p. 563.

18. *Ibid.*, p. 81-82.

19. J. Guimont (Ethnotech), *op. cit.*, p. 141.

20. *Ibid.*, p. 143.

21 Roxane Renaud, *Résultats de la recherche archéologique à l'îlot domestique de la terrasse Dufferin, Québec, 1981*, Microfiche Report No. 81 (Parks Canada, Ottawa, 1983), p. 26.

22. William Moss, *Archaeological Research in the Dufferin Terrace of Québec*, Microfiche Report No. 148 (Parks Canada, Ottawa, 1984), p. 165.

23. J. Guimont (Ethnotech), *op. cit.*, p. 141-146.

24. Québec, Ministère des Affaires culturelles, Fonds Morisset M 186/9 (P.G. Roy, *Bulletin de recherches historiques*, vol. V (July 1899), p. 307; *Gazette de Québec*, 15 November 1827).

25. *Ibid.*, Fonds Morisset, M 182/24 (*Journal de Québec*, 16 May 1854, p. 2).

26. C. Chartré, J. Guimont, Y. Laframboise and G. Pelletier (Ethnotech), *op. cit.*, p. 77.

27. W. Moss, *op. cit.*, p. 163-164.

28. *Ibid.*, p. 170-174.

29. Catherine Fortin, "Les macrorestes végétaux du Bas-Jardin, château Saint-Louis, Québec," manuscript (1987), to appear in the Microfiche Reports series, Canadian Parks Service, Ottawa.

30. Anthony Huxley, *An Illustrated History of Gardening* (London, Paddington Benne Ltd., 1978), p. 228-232.

31. Isabelle Hurphy and Frédéric Nicolas, *Effets de serres, conception et construction des serres bioclimatiques* (Paris, Edisud/Pye-Edition, 1981), p. 13.

32. Louis Neumann, *Art de construire et de gouverner les serres* (Paris, Audot, 1846, 2nd revised and enlarged edition of various articles, and of two engraved plates), p. 56.

33. A. Huxley, *op. cit.*, p. 234.

34. Jacques François Blondel, *Cours d'architecture, ou traité de la décoration, distribution et construction des bâtiments: contenant les leçons données en 1750 et les années suivantes dans son école des arts* (Paris, Desaint, 1771-1777), vol. 5, p. 391.

35. John Claudius Loudon, *The Green-House Companion* (London, Harding & Co., 1824), p. 22.

36. *Encyclopédie du XIX^e siècle: répertoire universel des sciences, des lettres et des arts, avec la biographie des hommes célèbres* (Paris, Au Bureau de l'Encyclopédie du XIX^e siècle, [1836-1855], 1846), p. 326.

37. L. Neumann, *op. cit.*, p. 16-22.

38. *Ibid.*, p. 5-8.

39. A. Poiteau *et al.*, *Le bon jardinier ou l'Almanach pour l'année 1848* (Paris, Chez Dusacq, 1848, 49th ed.), p. 140.

40. Philip Miller, *Dictionnaire des jardiniers* (Paris, Guillot, 1785, translation of the 8th edition [1768] of *The Gardener's Dictionary*), vol. 7, p. 26.

41. Denis and Rouard, *Traité complet de l'horticulture pour les grands et les petits jardins: précédé de La botanique simplifiée* (Paris, Challamel, 1846), p. 170-173.

42. J.C. Loudon, *op. cit.*, p. 25.

43. A. Huxley, *op. cit.*, p. 254.

44. L. Neumann, *op. cit.*, p. 23.

45. Denis and Rouard, *loc. cit.*

46. J.F. Blondel, *op. cit.*, p. 391.

47. A. Huxley, *op. cit.*, p. 160.

48. John Claudius Loudon, *An Encyclopaedia of Gardening* (London, Longman, Orme, Brown, Green, and Longmans, [1846], new enlarged and improved edition, foreword by J.C.L. [1834]), p. 643.

49. *Ibid.*, p. 484.

50. L.A. Aylmer, *op. cit.*, p. 293.

51. John Lambert, *Travels Through Canada and the United States of North America in the Years 1806, 1807, & 1808* (London, C. Cradock and W. Joy, 1813, 2nd corrected and improved edition), Vol. 1, p. 119.

52. William Cobbet, *The American Gardener, or a Treatise on the Situation, Soil, Fencing and Laying-out of Gardens; on the Making and Managing of Hot-Beds and Green-Houses; and on the Propagation and Cultivation of the several sorts of Vegetables, Herbs, Fruits and Flowers* (London, C. Clement, 1821, Stereotype Edition), chap. 11, No. 63.

53. *Voyage de Pehr Kalm au Canada en 1749* (Montréal, Pierre Tisseyre, 1977, annotated translation of the travel journal by J. Rousseau and G. Béthune with the co-operation of Pierre Morisset), f. 725.

54. J. Lambert, *op. cit.*, p. 11.

55. J.C. Loudon, *An Encyclopaedia of Gardening*, p. 340.

56. National Archives of Canada (NAC), RG1, E15A, Vol. 18, 31 October 1778 to April 1779.

57. *Encyclopédie du XIX^e siècle*, p. 322.

58. Diderot and D'Alembert, *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers, par une société de gens de lettres* (New York, Readex Microprint Corporation, 1969, reprinted from the edition published in Paris by Briasson, David L'Aîné, Le Breton, Durand, between 1751 and 1765), Vol. 1, Book IV (1754), p. 794.

59. B. Dufebvre, *Cinq femmes et nous* (Québec, Bélisle, 1950), p. 9.

60. NAC, RG1, E15A, Vol. 22, October to December 1781.

61. J. Guimont (Ethnotech), *op. cit.*, p. 112-113.

62. J.F. Blondel, *op. cit.*, p. 387.

63. P. Miller, *op. cit.*, p. 22.

64. L. Neumann, *op. cit.*, p. 35.

65. P. Miller, *op. cit.*, p. 31.

66. J.C. Loudon, *An Encyclopaedia of Gardening*, p. 609.

67. Denis and Rouard, *op. cit.*, p. 190.

68. L. Neumann, *op. cit.*, p. 18.

69. P. Miller, *op. cit.*, p. 22.

70. Diderot and D'Alembert, *op. cit.*, vol. IV (1762), p. 31, Plate V.

71. *Ibid.*, Vol. III (1765), p. 515.

72. NAC, MG24, A, 57, Mic. A-888, Sir John Coape Sherbrooke, 6 October 1816.

73. M. Quatremère de Quincy, *Dictionnaire historique d'architecture* (Paris, Librairie d'Adrien Le Clerc et Cie, 1832), vol. 2, p. 460.

74. NAC, RG1, E15A, vol. 269, 5 December 1815.

75. *The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge* (London, Charles Knight, 1833-1843), p. 320.

76. J.C. Loudon, *The Green-House Companion*, p. 28.

77. NAC, RG1, E15A, vol. 269. 25 January to 24 February 1816.

78. J.C. Loudon, *An Encyclopaedia of Gardening*, p. 583.

79. Idem, *The Green-House Companion*, p. 20-21.

80. Idem, *An Encyclopaedia of Gardening*, p. 604.

81. Denis and Rouard, *op. cit.*, p. 193-194.

82. J.C. Loudon, *The Green-House Companion*, p. 240.

83. J. Ch. Krafft, *Recueil d'architecture civile* (Paris, Bancé aîné, 1829, new ed.), plate 47.

84. NAC, RG11, vol. 83, 14 Nov. 1844.

85. *Ibid.*, MG23, RG11, 17, Series 1, vol. 21, p. 322, 24 May 1797.

86. *Ibid.*, RG1, E15A, vol. 13-35, 1773 to 1786.

87. Diderot and D'Alembert, *op. cit.*, vol. IV, Plate 11, fig. 23d.

88. Catherine Yasui, "The Faunal Analysis of Two Structures From the Dépendances du Château Saint-Louis, Québec City, Québec (1771-1854)," manuscript on file, (ZIC, National Museum of Natural Sciences, Ottawa, 1987), to appear in the Microfiche Reports series, Canadian Parks Service, Ottawa.

89. P. Miller, *op. cit.*, p. 27.

90. J.F. Blondel, *op. cit.*, p. 389.

91. L. Neumann, *op. cit.*, p. 35.

92. *Ibid.*, p. 8.

93. A. Huxley, *op. cit.*, p. 251.

94. L. Neumann, *op. cit.*, p. 5-8.

95. NAC, RG1, E15A, vol. 269, 5 December 1815.

96. *Ibid.*, 25 September 1815.

97. J.C. Loudon, *An Encyclopaedia of Gardening*, p. 363.

98. *Ibid.*, p. 484.

99. To find out more about the villas of Québec, the reader may consult the works by André Bernier and France Gagnon-Pratte listed in the Bibliography.

100. NAC, MG24, A, 57, Mic. A-888, Sir John Coape Sherbrooke, 10 March 1817.

101. J.M. LeMoine, *Monographies et Esquisses* (Québec, J.G. Gingras and Cie, 1885), p. 341.

102. Idem, *Picturesque Quebec: A Sequel to Quebec Past and Present* (Montréal, Dawson Brothers, 1882), p. 335.

Chapter 4

UTENSILS FOR THE GROWING OF PLANTS

Geneviève Duguay

The traces of gardens and the remains of greenhouses discovered under the Dufferin Terrace bear witness to an active horticultural life in the surroundings of the Château Saint-Louis. This study forms part of the research carried out to obtain an understanding of these activities, which have left a wealth of archaeological evidence. It deals specifically with cultivation, protection, and decorative utensils recovered during the excavations, and used between 1740 and 1854. Before discussing the archaeological collection, let us picture some of the numerous uses of these utilitarian implements known since ancient times.

THE USE OF PLANT-GROWING UTENSILS IN HORTICULTURE

Pots and trays made of unglazed coarse earthenware, like those found on the site, have been with us for a very long time. Especially appreciated for their porosity, which allows the plants to drain, and provides beneficial evaporation and oxygenation, they are also popular because of their availability, durability, and mobility. They come in standard sizes, can easily be stacked, stored, and arranged in close ranks in well-defined and ordered spaces, like those provided by greenhouse shelves and racks. A simple cleaning is enough before the same containers can be used again and, once broken, pots can be used as coarse gravel to provide a drainage layer on the bottom of new pots.

Container gardening makes it possible to grow delicate seedlings and exotic or frail plants, to bring plants inside during any sudden climatic changes, as well as to propagate and store them out of season. The plant pot serves the gardener at different times in accordance with the various cycles, types, and sites of production.

Often, the plants grown in pots are those that are not likely to flourish in the garden, or are not yet ready to be planted out. Some varieties have little resistance, while others need soil that is particularly alkaline or acid, or require growing conditions where the roots must be closely bound. Obviously, these conditions are easier to meet within the confines of a pot. New varieties can be tested and tried before they are introduced into the actual landscape or garden. After the seeds are grown in beds or wooden frames, the seedlings can be transferred to the garden in pots of an appropriate shape and size; therein they can grow until they are ready for transplant. The plants may be useful or decorative, indigenous or exotic, annual or perennial, and may include simple varieties of vegetables, flowers, bulbs, trees, and shrubs as well as rare species.

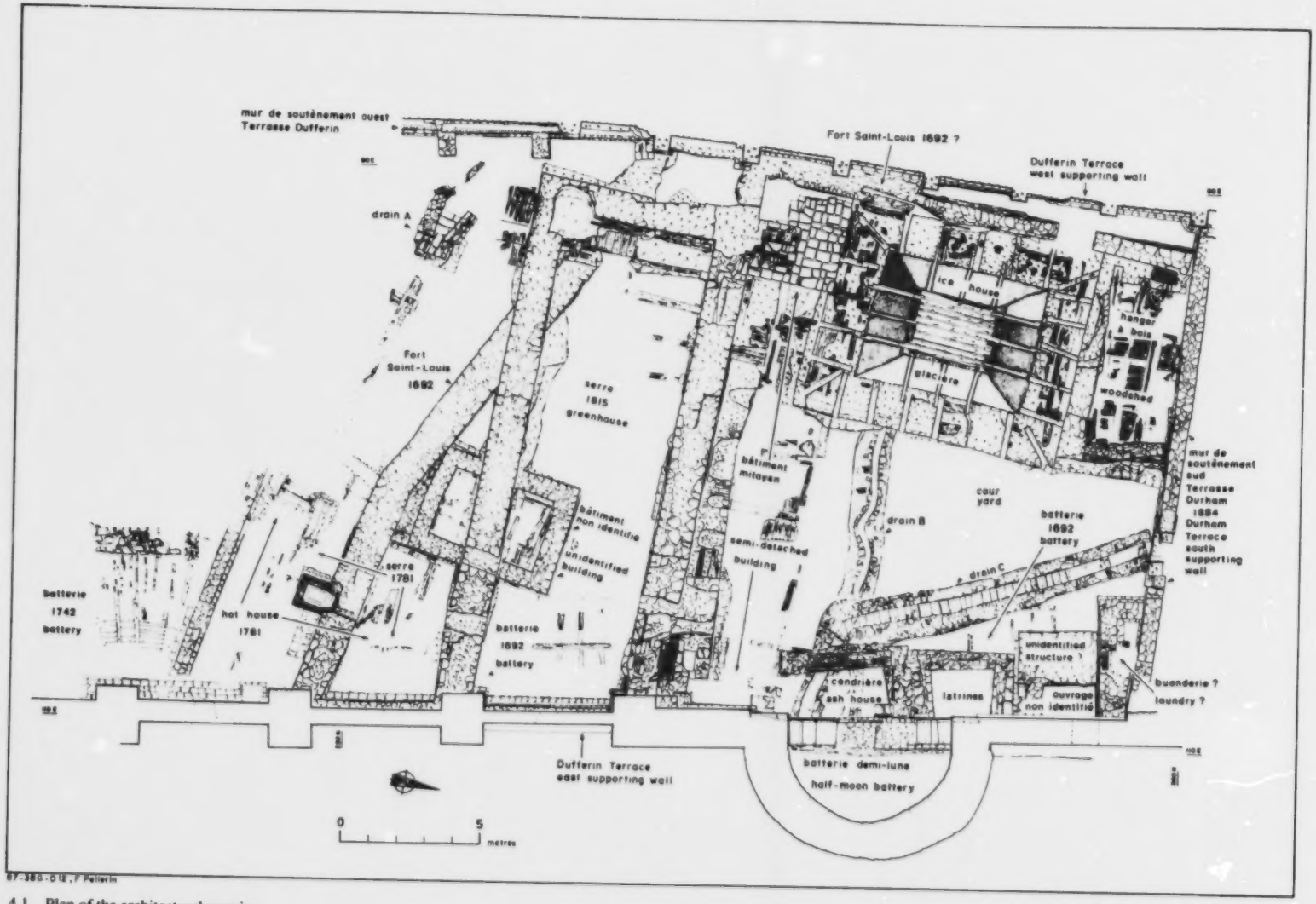
Some of these plants will be reserved for indoor gardens, including those that are used to decorate window sills, and pedestal or decorative tables, those that provide aromatic herbs, and those that transform the greenhouses into such delightful oases. Others may be intended for landscaping a park, or the immediate surroundings of a house.

Regardless of where the pots and trays are used, if need be, they can easily be carried to a more shady or sunny spot. Also they facilitate the watering, maintenance, and fertilization appropriate for each type of plant.

Plant boxes made of wood or coarse earthenware can also be used as containers, and provide the appropriate conditions for the growing of plants.

> *As to the respective merit of pots or boxes, I would say that I have tried both, and I have never been able to see much, if any difference in the growth of plants in them. I prefer pots, because they are more easily handled and kept clean, and are more durable.*[1]

Plant boxes are not as easy to handle as pots. This may explain why their arrangements have a more permanent character. Hanging from the ledge of a window, or a balcony or bannister, or even resting directly on the ground in a verandah, entryway, gallery, or along a path, they are a welcome sight. It is possible to seed the chosen plants directly in the



4.1 Plan of the architectural remains.

(Canadian Parks Service, drawing: François Pellerin; 87-38G-D12)

boxes, or to use them to hold pots which may be changed with their contents according to the season and flowering periods. The boxes in our collection are not indicative of any particular type of use. The examples made of coarse earthenware and which are impressed on the inside with the fingers, seem to have been designed to hold soil and plants directly (Fig. 4.11).

The *jardinières* or pot holders are ornamental pots designed to dress up the more utilitarian containers. They are present in a wide variety of materials, shapes and decorative styles, from the simple to the very refined. In *Window Gardening*, published in 1862, the author recommended the use of a common earthenware plant pot for growing, and a *jardinière* as decoration. His considerations were certainly derived from a long-established horticultural tradition:

> *Choose the common flower-pots, selecting those which are light colored rather than those which are brick red; the former are soft baked and are more porous; in these, the plants thrive better. Discard all glazed, china, glass or fancy painted pots; they are not porous, and plants seldom thrive in them. There is nothing neater than the common earthen pot if kept clean. If, however, something more ornamental is desired, choose some of the fancy pots — and some are pretty and artistic in design — and let them be large enough to set the common pot inside.*[2]

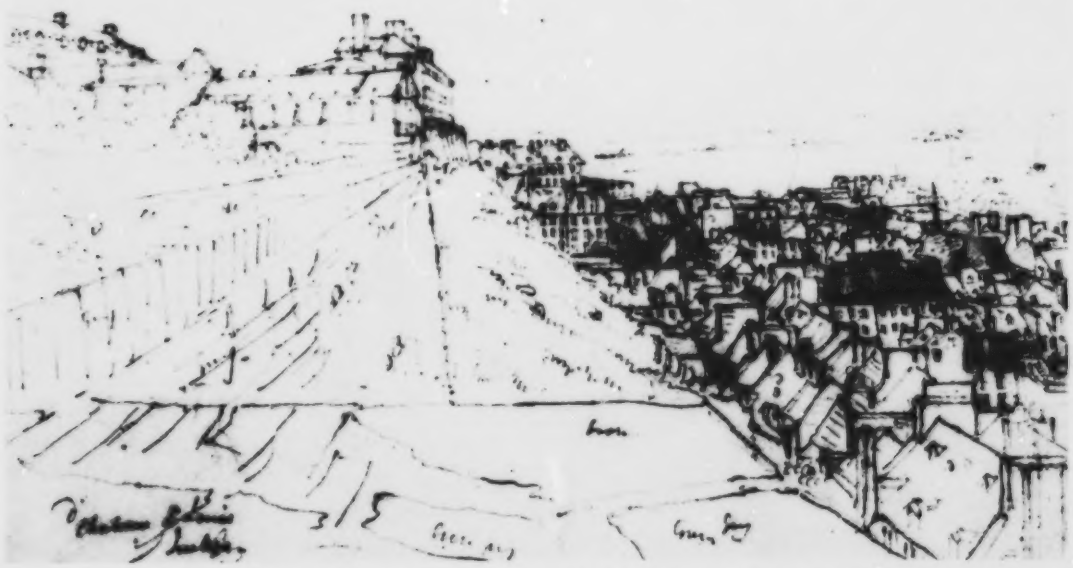
Gardeners also find glass bells useful for the cultivation and protection of plants. In a treatise by Denis and Rouard published in 1846, the types and uses of glass bells are described as follows:

> *Un jardin doit être muni de cloches, tant de verre que de paille; celles de verre servent à élever, l'hiver, sur couche ou en caisse, toutes sortes de plantes; et celles de paille, à garantir les plantes nouvellement transplantées du hâle et du soleil.*
>
> *A mesure que les plantes lèvent sous les cloches de verre, et qu'il y a de beaux jours, on doit donner de l'air, c'est-à-dire, élever les cloches d'un côté seulement, en les soutenant sur des fourchettes de bois ou crémaillères.*[3]

The authors suggest the use of glass bells for propagation in pots, and for growing the seeds of exotic flowers and plants. They write that the seeds of exotic flowers and plants should be planted in warm beds and protected with glass bells, until they are a little stronger, and the weather is suitable for transplanting.[4] They also recommend the use of glass bells for striking cuttings of green trees, a practice that they call *bouture sous cloche*.

> *La bouture sous cloche est en usage principalement pour les arbustes des zones tempérées et des tropiques. Des cloches, placées sur des boutures d'arbres verts, que l'on fait en pleine terre, en facilitent singulièrement la reprise.*[5]

The highly respected John Claudius Loudon distinguishes between two types of glass bells intended



4.2 View of the greenhouse and Lower Garden. ("From the Chateau Gardens, 1831," by James Cockburn; National Archives of Canada; I-150)

for different uses: one made of ordinary green glass, and the other of clear glass, which he calls *cristal*.

> *The common green glass bell is formed of bottleglass, and is commonly used in the open garden for protecting cauliflowers or other culinary plants, or for striking cuttings, or for retaining a moist atmosphere about seeds, & c.*
>
> *The crystal bell, or receiver, used in gardening is generally from three to eight inches in diameter, and from four inches to one foot in height. These glasses are employed in striking tender cuttings in the exotic departments, especially heaths.*[6]

On all evidence, glass bells, those small portable greenhouses, should form part of the equipment of any serious and experienced gardener. In the second half of the 18th century, they were sufficiently valuable to be mentioned in some estate inventories of prestigious gardeners in New England.[7] This period corresponds to the time when our broken glass bells were finding their way into the soil of Cap Diamant. For his part, John Claudius Loudon describes them as "essential utensils" together with the sieve, the plant pot, and the watering can.[8]

THE ARCHAEOLOGICAL COLLECTION

The archaeological collection consists mainly of unglazed coarse earthenware plant pots and trays. It also includes some earthenware *jardinières*, plant boxes made of wood and coarse earthenware, and glass bells. Let us look more closely at the nature of these objects, their origin, and their shapes, sizes, and decoration.

4.3 Plant pots and trays found under the Dufferin Terrace. From left to right, at the back: pot (1815-1854), pot (1815-1854), tray (1815-1854), pot (1854), tray (1815); in the front: tray (1854), pot (1815-1854), pot (1771-1815).
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P15)

The Pots and Trays

Materials

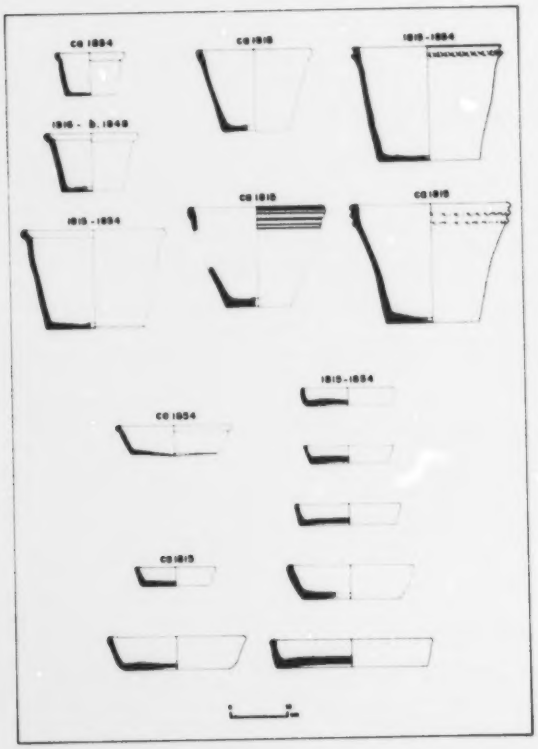
Three ceramic bodies were identified. The large group of unglazed coarse earthenware pots includes two series: one comprised of common products that form most of the collection, and the other made up of a type attributed to the potteries of the northeast of England. A third series, which is related to fine earthenware, consists of shards made of an unglazed pink earthenware.

Series 1. Unglazed coarse earthenware, common variety (Fig. 4.4)

The colour of the body is reddish, varying from a reddish yellow to a darkish brown. Readings obtained with the help of the Munsell colour code revealed the dominant presence of reddish yellow, followed by red, and light red. Pink, yellowish red, and brown are significantly less well represented. The body is porous and soft, and more or less coarse depending upon the type, size, and number of inclusions. In most cases, it is sandy and very micaceous with a few small and medium-sized particles of quartz and ochre. Cavities of various sizes add to the plastic dynamics of the clay. The texture is soft, but may sometimes be rough in the case of the more sandy specimens.

The pots have been evenly baked, even though there are sometimes traces of oxidation and reduction, or glazing spots caused by putting objects with and without glaze in the kiln, at the same time. The surface has been smoothed by wiping on both sides. All the objects were shaped on a potter's wheel.

At the present time, we are unsure of the origin of this ceramic type. The rusticity of the materials and shapes, and their very utilitarian character, suggest that they may have been made locally, or at least by a small-scale craftsman. In Saint-Denis sur Richelieu, an analysis of five potters' shop inventories dating from between 1810 and 1865, indicates that this type of production accounted for 0.7%, or a little less than that of chamber pots (0.9%). The largest share of the production was held by earthenware bowls and terrines (78.4%), dishes (9.0%), large pots (6.2%), and small pots (4.9%).[9] On the one hand, it is



4.4 Plant pots and trays, series 1.
(Canadian Parks Service, drawing: Louis Lavoie; 87-38G-D13)

possible that local networks may have included the neighbouring New England market. On the other hand, even though it may not seem very probable that one would call upon the larger colonial market for a common product sold locally at little cost, this hypothesis should not be eliminated completely. An advertisement, published in the 19 April 1843 edition of the newspaper *Le Canadien*, offers flower pots of superior quality just arrived from Bridgewater in England.

This series is present in all occupation levels, between 1740 and 1854.

Series 2. Glazed coarse earthenware, northeast of England (type) (Fig. 4.5)

The body is red (Munsell 2.5 YR 4/6) and dense, not very porous, and hard. The numerous fine inclusions include grey and black sand, mica flakes, and a few scattered quartz particles.

Normally, this type of body is coated with a white slip and a clear lead glaze. Here, these two elements are absent. A single drop of glaze appeared on the outside surface of one pot.

The most complete object was crafted with care, and fired at a relatively high temperature, giving it a hardness that is close to that of stoneware. The upper surface was darkened by the charging and firing conditions.

This type of production, which evolved from British traditions, may also have come from workshops in New England or in England itself. It dates from the end of the 18th century and the early 19th century.

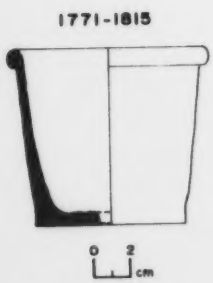
Series 2 is present in an archaeological context which dates to the 1780 to 1815 period.

Series 3. Unglazed earthenware with pink body (Fig. 4.6)

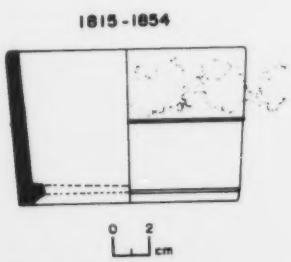
The body is homogeneous and has a pink colour (Munsell 5YR 7/4), its texture is porous and soft. Here and there, it is sprinkled with very fine mica particles. The colour of the body could be due to the presence of iron impurities, despite a certain refinement of the clay.

The single object representing this series was made on the wheel with the help of a jolley.[10]

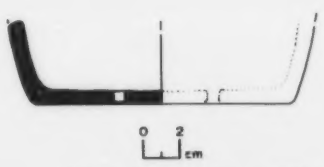
This fine-bodied earthenware is a precursor of the earthenwares with coloured bodies produced in



4.5 Plant pot, series 2.
(87-38G15-D1)
(Canadian Parks Service, drawing: Louis Lavoie)



4.6 Plant pot, series 3.
(87-38G15-D2)



4.7 Bottom of a plant pot with several drainage holes. (87-38G13-D1)

the second half of the 19th century. Its precise origin is unknown: it was derived from British traditions, and could have come from Europe or from North America. At that time, pottery manufacturers on both continents shared common practices, and worked in accordance with the same standards, in order to meet similar needs, and fashion demands.

The object in this series can be dated to the 1815 to 1854 period.

Shapes and Decorations

The plant pots in the collection are in the shape of an inverted truncated cone. They have a drainage hole in the centre of the base and, in only one case, several holes symmetrically distributed around the bottom (Fig. 4.7). Generally, the perforations are quite rough, but at times they were done with greater care. The straight walls have regular proportions, which may have made them easier to stack. The rims show various profiles, but their characteristics do not seem to have been determined haphazardly. Our terminology derives from an observation of the physical elements, as modelled by the work of the artisan.

The rim may have a **straight lip** — as a direct extension of the walls — which may be flat (Fig. 4.9-10), rounded (Fig. 4.10-1), folded back toward the outside to form a straight horizontal flange (Fig. 4.11-3); or have a **sloping lip** — or inclined wall — which is rounded toward the outside (Fig. 4.12-5), with or without a ridge on the inside. As the result of a folding motion, it may curl to form a **rolled hem** (Fig. 4.9-1); or a triangular **pad** (Fig. 4.11-1), which may be flat (Fig. 4.9-9), rounded on the outside (Fig. 4.9-8), rounded both on the inside and on the outside (Fig. 4.11-2), or rounded on the outside with a ridge inside (Fig. 4.12-4).

The pots were decorated using various techniques. Decorations, though infrequently found, are present within each of the various periods. We have identified the following types: incised (simple chevrons, Fig. 4.8-2), shaped on the wheel (grooves, Fig. 4.8-3), turned and then shaped (moulded profile, Fig. 4.8-5; simple undulations, Fig. 4.8-6; double undulations, Fig. 4.8-7), applied (vine leaves and grape clusters, Fig. 4.8-8). A few specimens found in contexts unrelated to this study (late 19th century for the first three, and first half of the 19th century for the last) are representative of other types of decoration: embossed with a coggle wheel (double chevrons, Fig. 4.8-9; chains, Fig. 4.8-10), glazing on the outside of the object (Fig. 4.8-11), and applied ornaments (geometrical motifs, Fig. 4.8-12). Some of the objects have been covered on the outside with an unidentified light yellow coating, powdery texture, and a white substance that could be paint. In another pot, the lip was underlined with a brown stripe on both sides. This seems to have been applied with a cloth soaked in a slip (Fig. 4.8-1). The latter effect could nevertheless be accidental, which in no way negates its esthetic value.

The trays are also in the shape of an inverted truncated cone, and their bases have a flat bottom. The short walls are straight. Most of the objects were turned with skill and are well proportioned. They should be appropriate for their task, and stack easily.

The rims are either in the form of a **straight lip** that may be flat (Fig. 4.9-11), rounded (Fig. 4.9-12), or with a bevelled top (Fig. 4.9-13); in the shape of a rounded **pad** on the outside (Fig. 4.13-7); or rounded both on the inside and the outside (Fig. 4.12-10).

None of the trays had any decoration.

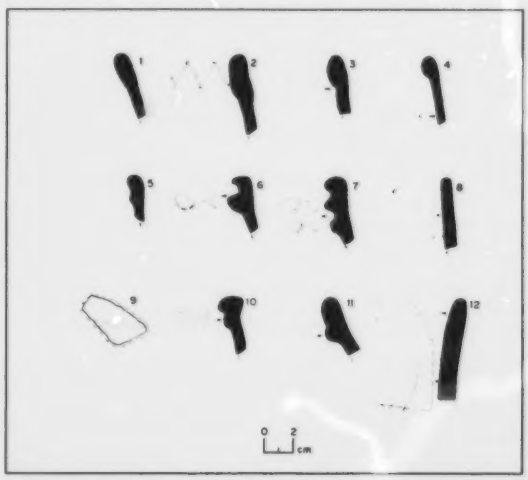
Dimensions

The most complete pots come in various sizes, and most were quite deep. On the whole, we found that there was a predominance of medium and large sizes.

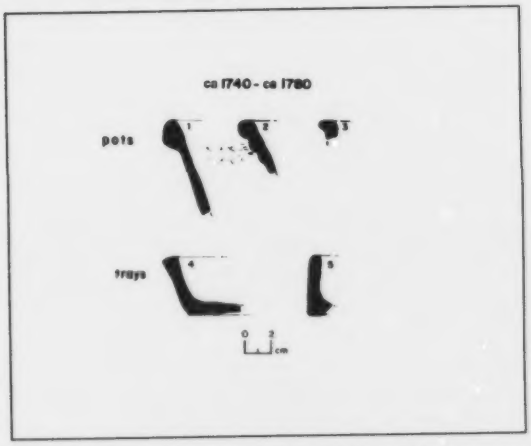
According to the recorded dimensions, the diameter of the base varies from 4.5 cm to 19 cm, and the diameter of the top from 7 cm to 33 cm. The height varies between 5.5 cm and 20.2 cm. Most have bases measuring over 10 cm, and rim edges measuring over 14 cm.

The trays were also present in a wide variety of formats with a preponderance of medium and large sizes. In the most intact objects, the depth of the bowl was variable.

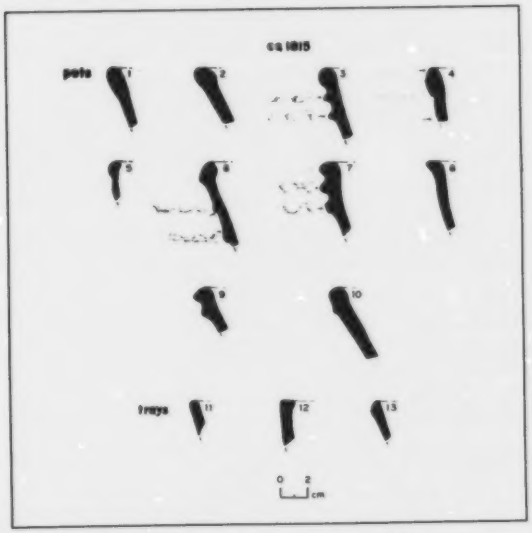
The diameter of the base varies between 11 cm and 25 cm, the diameter of the rim from 11 cm to 28 cm, the height from 3.1 cm to 6.3 cm, and the depth from 1.7 cm to 5.1 cm. The most frequently found sizes measured over 16 cm for the top, and 14 cm for the base, with a concentration around 18 cm for the base and over 20 cm for the top.



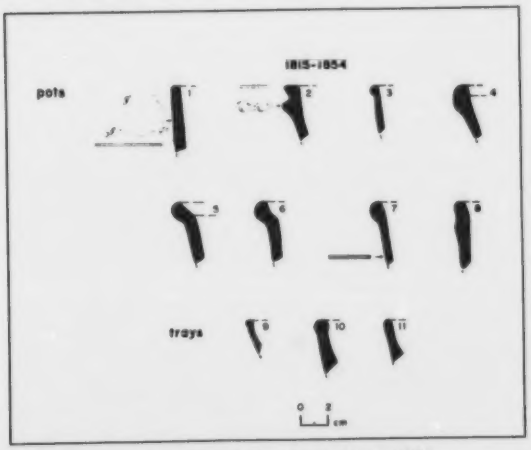
4.8 Decorations. (Canadian Parks Service, drawing: Louis Lavoie)



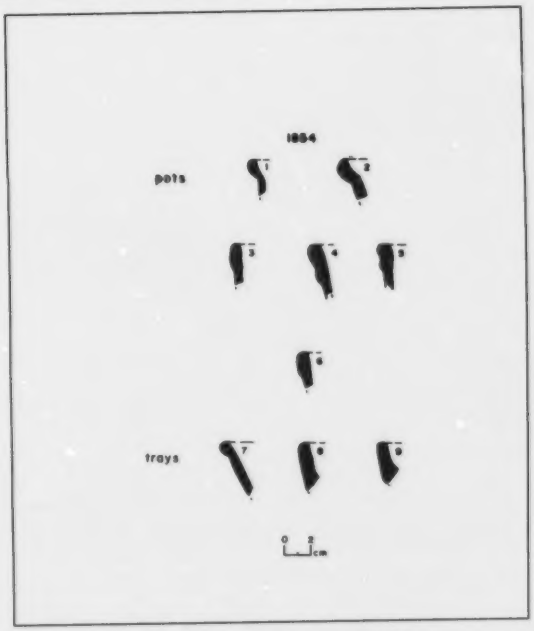
4.11 Rims of pots and trays dating from 1740 to 1780.
(87-38G-D17)



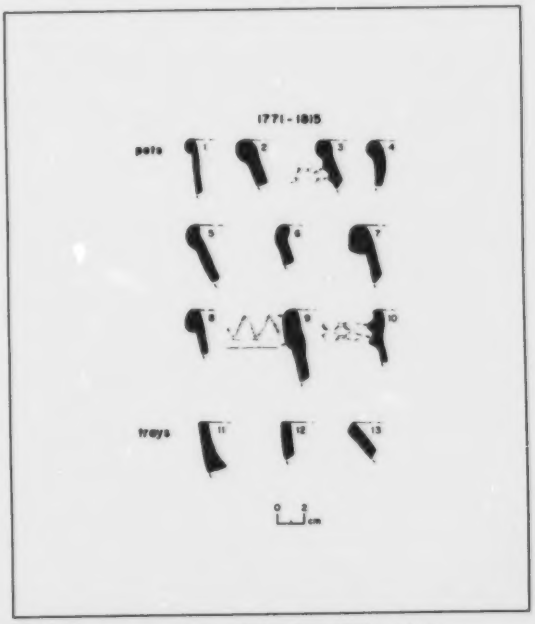
4.10 Rims of pots and trays dating from circa 1815.
(87-38G-D19)



4.12 Rims of pots and trays dating from 1815 to 1854.
(87-38G-D20)



4.13 Rims of pots and trays dating from circa 1854.
(87-38G19-D2)



4.9 Rims of pots and trays dating from 1771 to 1815.
(87-38G-D18)

(Canadian Parks Service, drawing: Louis Lavoie)

The *Jardinières*, Plant Boxes, and Glass Bells

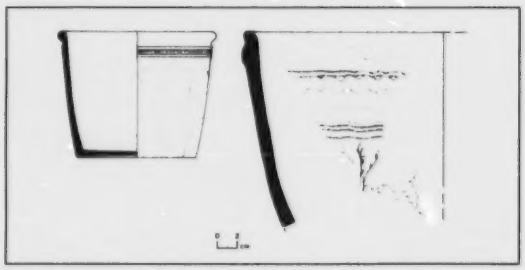
A few other objects in the collection were used for the cultivation, display, and protection of plants. *Jardinières*, plant boxes, and glass bells are all utensils used in horticultural practice.

The two *jardinières* found differ in terms of materials, shape, format and decoration. The first presents us with an identification problem. Considering the present condition of the object and what we know, it is practically impossible to decide whether it is a *jardinière* or a cooler. Our object is in the shape of an inverted truncated cone and was made of tin-enamelled earthenware; it is probably of French origin, and is decorated in blue and black geometric and floral painted motifs (Fig. 4.14-2). The diameter of the rim is 38 cm, which is large for either of the possible objects. We have not been able to determine whether it had handles; the presence of handles would not be enough to discriminate between the two possibilities. Given that we have only part of a wall and rim, we were unable to determine whether or not it had a drainage hole (implying the use of a tray), or a hole that could be used to attach a pedestal, which was generally made of wood. This object was found in a layer attributed to the 1740 to 1780 period.

The second jardiniere has an unglazed beige body made of fine clay. Similar to fine stoneware, it was fired at lower temperatures, and is somewhat porous. It is very close to a type known as cane ware,[11] and it may have simply been fired less carefully, because of its intended use. It is in the shape of an inverted truncated cone, and decorated with a press-moulded geometric motif (Fig. 4.14-1). Its walls are decorated with parallel vertical stripes which alternate between the original beige and a black slip; a horizontal beaded line runs under the lip. The diameter is 12 cm at the base and 17 cm at the top rim. Developed around 1770, cane ware is a fine stoneware in the British tradition. Our example was found in a layer associated with the construction of the greenhouse around 1815.

The plant boxes, also known as flower cases or window boxes, were found in two different materials. We have a plant box made of five pieces of coniferous wood, held together by ten brackets made of forged iron and attached with nails, eight of which are arranged in pairs in the corners, and two that used to attach the bottom to the walls. No other fixtures were found. This box is rudimentary, roughly executed, and the only decoration consisted of a few traces of white paint (Fig. 4.15). It may have been made locally by the carpenter, the handyman, or the gardener. It was found in the latrines, and dates from 1815 to 1854.

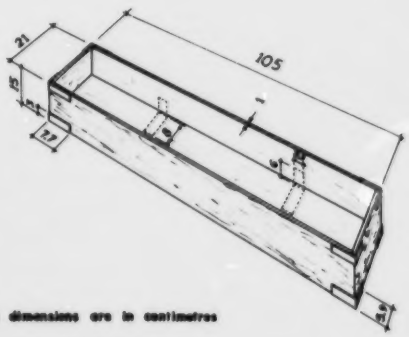
Six other plant boxes were made of coarse earthenware (Fig. 4.16). Two of them had been coated with a brown glaze on the side walls only and four apparently had no glazing. They were made with a mould that determined the shape and size of the object; this mould was probably a wooden box. The walls, flat and smooth on the outside, were formed by pressing the fingers in the damp clay. The top is surrounded with a straight flat border and is smooth on the outside. It was also modelled with the fingers



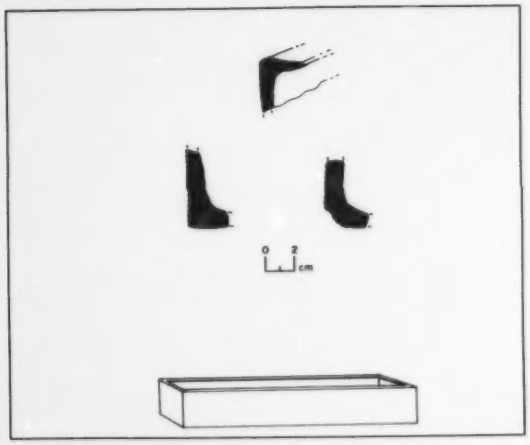
4.14 *Jardinières*. (Canadian Parks Service, drawing: Louis Lavoie; 87-38G-D15)

on the inside. Only one of the flower boxes was decorated, apart from having been coated with a brown glaze. The lower edge is embellished with a convex bevel. The fragmentary state of these objects does not allow any extrapolation of their dimensions.

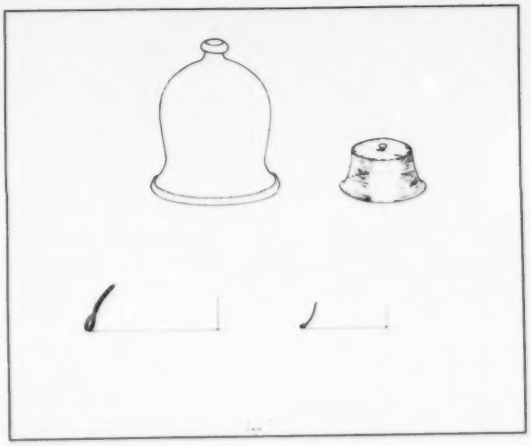
These products may have originated in North America or Europe. They were found in layers dating to the 1740 to 1780 period (3 objects), 1815 (2 objects), and 1854 (1 object).



4.15 Wooden plant box.
(Canadian Parks Service, drawing: Francois Pellerin; 87-38G19-D1)



4.16 Plant boxes made of coarse earthenware.
(Canadian Parks Service, drawing: Louis Lavoie; 87-38G-D16)



4.17 Glass bells.
(Canadian Parks Service, drawing: Francois Pellerin; 87-38G15-D3)

The glass bells, one in dark green glass, and the other in unleaded clear glass, were truly in the shape of a bell. The lower portion has a rim curling to the outside, which is wide in the case of the dark green glass, and narrow in the case of the unleaded clear glass (Fig. 4.17). On the basis of old engravings, and the results of excavations carried out in Williamsburg, we know that the upper part ended in a knob used to hold the bell for carrying or setting it in place. The dark green glass bell has a rim diameter of 40 cm, and the clear glass bell has a diameter of 26 cm.

In the case of Williamsburg, the objects were imported from England. They were also known in France where they had been used for a long time. The glass bells in our collection, which were found in layers corresponding to the British regime (1771 to 1815), could be of British origin. Known as objects with a specialized function for use by expert gardeners, they were almost certainly imported from other countries.

THE OBJECTS AND THEIR RELATIONSHIP TO EVENTS

The Context

The objects collected bear witness to events that can be read through the careful observation of stratigraphic layers and their relationships with architectural remains. The spatial distribution on the site is extensive, and the chronological scale cuts across all the occupation periods. We have selected a series of events grouped by periods, the dates of which hinge around the construction, occupation, or demolition of the main outbuildings, the abandonment of military works or the building of drainage canals. These various contexts contain 2,728 fragments of plant pots and trays, apart from 187 fragments of other types of utensils, distributed over five main periods (Table 1).

The first period, from **1740 to 1780**, includes activities that were contemporaneous with the abandonment of Fort Saint-Louis (where the southeast bastion was refashioned for horticultural purposes between 1779 and 1780), and the construction of the icehouse and the woodshed. It includes eleven different events, but yielded few artifacts.

The second period, from **1771 to 1815**, includes the occupation of the site by the first hot-house and its shed, and the backfilling of the battery of the Château with earth containing traces of activities related to horticulture. It includes events that predate the construction of the second greenhouse and lean-to, and those posterior to the construction of drain C (before 1816) (Fig. 4.1). This period includes six events, and the artifacts obtained were mainly those related to horticultural activities.

The third period, about **1815**, includes the abandonment and demolition of the first hot-house and shed, and the construction of the second greenhouse and lean-to. It is comprised of six events. By itself,

Distribution of Plant-Growing Utensils, by Period of Occupation

CA. 1740 TO CA. 1780

POT		TRAY		*JARDINIÈRE*		PLANT BOX	
no. art.	no. obj.	no. art.	no. obj.	no. art.	no. obj.	no. art.	no. obj.
23	16	14	11	4	1	3	3

1771 TO 1815

POT		TRAY		*JARDINIÈRE*		GLASS BELL	
no. art.	no. obj.	no. art.	no. obj.	no. art.	no. obj.	no. art.	no. obj.
299	151	83	36	2 *	0	8	2

CIRCA 1815

POT		TRAY		*JARDINIÈRE*		PLANT BOX	
no. art.	no. obj.	no. art.	no. obj.	no. art.	no. obj.	no. art.	no. obj.
578	88	110	35	2	1	2	2

1815 TO 1854

POT		TRAY		*JARDINIÈRE*		PLANT BOX	
no. art.	no. obj.	no. art.	no. obj.	no. art.	no. obj.	no. art.	no. obj.
542	149	155	47	154	1	11	1

1854

POT		TRAY			PLANT BOX	
no. art.	no. obj.	no. art.	no. obj.		no. art.	no. obj.
751	144	174	47		1	1

* artifacts belonging to the *jardinière* dated circa 1815

Table 1

the abandonment of horticultural activities in the first hot-house produced 636 of the 688 artifacts.

The fourth period, from **1815 to 1854**, was characterized by intense activity in the courtyard leading to the outbuildings, and reveals the use of the ash house, the latrines, and the 1815 greenhouse and lean-to. This period is represented by seven distinct events that have produced a large quantity of artifacts, which were collected especially in the courtyard (335 of 697).

The fifth period, **1854**, was marked by a change in the type of activity carried out on the site. In fact, the extension of the Durham Terrace led to the demolition of the outbuildings and the levelling of the ground. These events produced a thick stratum made up of demolition debris mixed with the most recent remains of previous occupations. Three events yielded 925 artifacts, which represent the greatest set in the collection. Most of them (791 artifacts) were obtained in the courtyard.

Interpretation

The first characteristic of the plant-growing utensil collection is related to the simplicity of the materials represented. The pots and trays are utilitarian and common, and almost all the objects observed are made of unglazed coarse earthenware. Only the *jardinières* give some indication of refinement. However, the presence of pots and trays made of other materials, in highly decorative forms, has been thoroughly illustrated in ceramics encyclopedias and manufacturers' catalogues of the 18th and 19th centuries. The Wedgwood factory in Etruria and the Dunderdale factory in Castleford had marketed creamware "flower pots and stands"[12] decorated with applied motifs that were shaped, press moulded, incised, or embellished with coloured slips. These objects would certainly have been more expensive. Tin enameled earthenware plant containers made in Rouen and Nevers[13] and jasper ware[14] are also known to have been produced. However, no example of this kind was found in our collection. Could this be because, due to their decorative value, these objects would have been found in the Château rather than in the greenhouse or its surroundings? The iconography reveals that utilitarian containers (common pots and trays) were used in domestic interiors, at least from 1812 on, and undoubtedly even before. It also seems that this was the case both in modest houses, and in the more comfortably off dwellings.[15]

The second element has to do with the shapes of the rims of the plant pots, which are present in a surprising variety. Their classification is organized around four principal profiles: with the rim folded to form a rolled hem or a pad, and with the lip straight or slanted. The diversity observed quickly leads to a classification based on secondary attributes. The pad may be rounded, flat, or have a triangular profile; the straight lip may be flat, rounded, or folded back to form a straight flange; the interior may or may not be underlined with a ridge. These components do not appear to be characteristics proper to the breaking up of the objects or to the peculiarities of the craftsman. They distinctly reflect an affiliation with other shapes produced by the pottery workshops where they were made. Some rims with a rounded pad are reminiscent of those found on terrines, others have slanted lips like flanged dishes and jars, or have straight lips like those of bowls. It is nevertheless difficult to guess at the original intention of the artisan, without getting into the realms of the impenetrable.

When we examine these various rim shapes in relation with the historical contexts, some characteristics become evident. For the periods between 1740 and 1815, the rims of plant pots had rounded pads (Fig. 4.11-2), or a triangular profile (Fig. 4.11-1), and rounded straight lips (Fig. 4.10-1), or projected out into a narrow flange (Fig. 4.11-3). However, the examples with a rounded straight lip, like those that have a ridge on the inside, appear only in the historical context spanning between 1780 and 1815. The slanted lip is present only in collections dated after 1815. Finally, we found profiles that seem to be evolving toward the "collar" rim of our contemporary pots (Fig. 4.12-8 and Figs. 4.13-3, 4, 5, and 6). They were found in association with events dated between 1815 and 1854, but especially with those associated with the 1854 demolition layers.

The most frequently found type of decoration was the double undulation. While the potter turns the object on the wheel, two horizontal and parallel ridges are made in the damp clay. These are shaped, after the wheel stops, with a stick or with the fingers, and then folded back with a sloping motion toward the bottom. The double undulation was found on twenty-three objects, both under a rim with a rounded pad (Fig. 4.11-2), and below a flat straight lip (Fig. 4.9-10). It was the only decoration found in objects dating from 1740 to 1780. It also appears on a large number of objects dating from about 1815 (15/23); a few examples are also associated with the period between 1815 and 1854. A variation on this decoration, a simple undulation, was found between 1780 and 1854, especially on artifacts dating from

about 1815. Parallel lines incised while turning on the wheel were found in contexts associated with the period between 1815 and 1854. All other types of decorations were little represented, only on one or two objects each, and the chronological correspondence can be established as follows: incised linear decorations, with the period between 1780 and 1815; a horizontal ridge below the lip, with 1815 and 1854; stripes made while turning on the wheel, and applied plant decorations with 1815 to 1854; and white and yellow coatings with 1854.

Regarding the use of coatings, an 1881 reference describes that adding a coat of paint to the pots was a widespread practice. The author, however, does not recommend it: "If pots are used, don't paint them, as many do. The more porous a pot is, the better, and your coat of paint fills up the pores and keeps out the air, and keeps the water in."[16]

The sizes of the pots and trays found indicate on the one hand, a very wide variety and, on the other, a preponderance of the medium and large size formats. In the gardening manual cited above, the following recommendations are made regarding the sizes of pots one should have on hand:

> *The size of the pot should be in unison with the size of the plant; the most convenient ones to handle, may measure from five to seven or eight inches across top. Yet if any have extensive window gardens, they will need all sizes — from 3, 4, 5 and 6 inches diameter, up to eight inches — some for propagating purposes, others for shifting into, from smaller sizes. Saucers of course, of the proper sizes, should fit each pot.*[17]

The objects in our collection come in a wider range. No data relative to sizes can presently be used to establish a relationship with the type and place of production.

Loudon establishes a distinction between eleven types of pots that are different in terms of their standard dimensions and that are sold by numbered casts. These are two, four, six, eight, twelve, sixteen, twenty-four, thirty-two, forty-eight, sixty, and eighty. The figure indicates the quantity in each cast, and is inversely proportional to the format. Number two pots, measuring 18" (45.7 cm) in diameter by 12" (30 cm) in height, were sold two per cast, and cost the same as the number eighty pots or thumbs, which measured 1½" (3.8 cm) in diameter by 2" (5 cm) in height, and were sold in groups of 80.[18]

4.18 Could this be the Château's gardener? ("The Chateau St. Louis," by James Cockburn, 1829; Toronto, Royal Ontario Museum; 942.48.86, 68 CAN 72)

Our collection shows that unglazed coarse earthenware trays were used as early as the first period (1740 to 1780). For each of the chronological stages, there are always between one and a half and six times more pots than saucers. Even though the iconography shows saucers throughout the entire period from 1760 to 1900, they were not used for all the pots. In one kind of setting, pots may be placed on a tray while in others they are not.[19]

The origin of most of the products in the collection remains unclear. We know that the users of glass bells and *jardinières* had to call upon import networks. However, among the other objects, we have found only one plant pot that was certainly imported (series 2). The present state of knowledge indicates that the rest of the products represent a local supply, but nothing confirms the complete absence of the two strongly developed networks from New England and England itself.

Modest but indispensable, these ceramic products form part of a number of study subjects that are often neglected by history. Archaeology gives us access to the gardens and backyards and to the work and daily activities of a whole world of humble servants, without whom life in the Château would not have been possible.

G. D. ■

NOTES AND REFERENCES • CHAPTER 4

1. Eben E. Rexford, *Flowers in Winter* (Chicago, 1881), p. 13, cited in Lynne Sussman, "Flower Pots and Jardinieres in 18th and 19th Century Settings," Unpublished iconographic file (Parks Canada, Ottawa, 1985).

2. Henry T. Williams, *Window Gardening* (New York, 1862), p. 56, cited in L. Sussman, *op. cit.*

3. Denis and Rouard, *Traité complet de l'horticulture pour les grands et les petits jardins: précédé de La botanique simplifiée* (Paris, Challamel, 1846), p. 189.

4. *Ibid.*, p. 426.

5. *Ibid.*, p. 204.

6. John Claudius Loudon, *An Encyclopaedia of Gardening* (London, Longman, Orme, Brown, Green and Longmans, [1846], new expanded and improved edition, Foreword by J.C.L. [1834]), p. 546-547.

7. On this subject, see Audrey Noël Hume, *Archaeology and the Colonial Gardener* (Williamsburg, VA, The Colonial Williamsburg Foundation, 1974, Colonial Williamsburg Archaeological Series No. 7), p. 63.

8. J.C. Loudon, *op. cit.*, p. 547.

9. Camille Lapointe, "La collection de terre cuite grossière des sites de potiers de Saint-Denis-sur-Richelieu," manuscript on file (Direction générale du patrimoine, ministère des Affaires culturelles du Québec, Québec, March 1982), p. 12.

10. This technique consists of using a mould rotating upon itself in order to form the bottom and outside of the object, and hand shaping for the top and the inside; then, the object is turned on the wheel again, in order to form the foot.

11. See George Savage and Harold Newmann, *An Illustrated Dictionary of Ceramics* (New York, Van Nostrand Reinhold, 1976), p. 63.

12. See: Geoffrey Godden, *An Illustrated Encyclopaedia of British Pottery and Porcelain* (New York, Bonanza Books, 1965), p. 349, for an illustration obtained from the Wedgwood catalogue in 1817; and *The Castleford Pottery Pattern Book 1796* (England, EP Publishing Limited, 1973, reprint of the edition published by D. Dunderdale in 1796), illustrations no. 13 and 236.

13. See Catherine Arminjon and Nicole Blondel, *Objets civils domestiques: vocabulaire* (Paris, Imprimerie nationale, 1984), p. 519.

14. See G. Savage and H. Newmann, *op. cit.*, p. 96.

15. Lynn Sussman, *op. cit.*, illustration of a watercolour by A. Garnerey entitled *Bedchamber of the Austrian Embassy*, Paris, 1812.

16. E.E. Rexford, *op. cit.*, p. 13.

17. H.T. Williams, *op. cit.*, p. 57.

18. J.C. Loudon, *op. cit.*, p. 540.

19. L. Sussman, *op. cit.*

Chapter 5

MASTERS OR SERVANTS?

Monique Élie

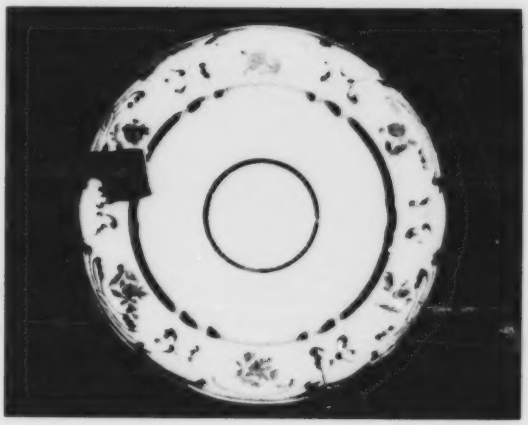
Well before excavations were started in the southeast courtyard of the Château Saint-Louis, some people, with a gleam in their eyes, were foretelling the finding of a wealth of beautiful, refined, tasteful, rare, and expensive objects. After all, was it not the courtyard of the Governor's residence? The discovery of several remarkable objects did in a way confirm this wishful prophecy.

Ordinary or low-priced objects were also found. Was it because the site, which was occupied between 1770 and 1854 by utilitarian buildings, such as a woodshed, an icehouse, greenhouses, other outbuildings, a laundry, latrines, and an ash house, was not reserved for the exclusive use of the masters of the house? To whom do the various material remains recovered relate? To what extent do they reflect the life of the Governor and his family? In order to explore these questions, we will first examine those objects in the collection that give an impression of luxury, and how this impression resists comparisons in terms of their value, variety, and numbers. Subsequently, we will introduce the people who may have frequented the site during this period of domestic occupation; and finally, we will look at the ways in which these people may have acquired the more or less luxurious goods discovered during the excavations.

AN IMPRESSION OF LUXURY

What are the criteria that generally lead to the impression that an object is luxurious, or that a collection bears witness to the presence of people of wealth? An object made of a stronger material is better suited to its task, more pleasing to the eye and touch, or more unusual will often be considered as a sign of wealth. A shape that is particularly beautiful or uncommon could also affect our evaluation in the same sense. The presence of decorations, especially if they are rare, or elaborate, difficult to execute, carefully rendered, or embellished with precious metals also seems to increase the value of an object. This is also true of objects that are not obviously utilitarian, or that have one or more characteristics that do not seem essential, of objects that have an unusual or specialized function, and of exotic foods, or the more tender cuts of meat. When a domestic site reveals large quantities of objects, we tend to believe that their past users were wealthy, especially if many objects exhibit the attributes listed above. This is because we associate luxury with the quality, variety, and quantity of the objects that reveal the occupation of a site.

Several objects found in the area situated to the southeast of the Château Saint-Louis, particularly in the latrines, give an impression of quality. As far as the ceramics are concerned, the most striking examples are undoubtedly the so-called bone china plates in English porcelain where the decoration, of Viennese inspiration, is moulded and enhanced by 24 carat gold painted and applied motifs (Figs. 5.1 and 5.2); or the pitcher or cream jug of the same material whose shape and moulded decorations painted in green, yellow, red, and thick gold are reminiscent of the rococo style (Fig. 5.3). A glass container, possibly used as a bottle holder, with a fluted base and a rim decorated with a Greek border, originally embellished with an applied decoration, possibly gilded, suggests the same idea (Fig. 5.4). This image is also enhanced by a copper alloy animal foot that could have been used as the corner support for a letter box



5.1 Top quality porcelain plate with moulded decoration embellished with 24 carat gold, of Viennese inspiration (Davenport, 1820). Diameter: 24.5 cm.

(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-148)

or jewellery case, or even a clock (Fig. 5.5). The presence of bones from choice cuts of meat also indicates that we are dealing with wealthy consumers.[1]

The variety of objects and decorations present in the collection are also indicative of wealth. Several objects, or their attributes, belong to a category which, when put in relation with the essential needs of human beings, seems superfluous. For example, certain items serve very specialized functions. These include egg cups (Fig. 5.6), mustard pots (Fig. 5.7), sauce boats, coolers, champagne bottles (Fig. 5.8), and a smelling salts bottle (Fig. 5.9). There are breakfast (Fig. 5.10) and tea services, and wine glasses, as well as simple and rummer goblets (Figs. 5.11, 5.12, and 5.13); while various types of jugs, pitchers, bottles, and decanters (Figs. 5.3, 5.8, and 5.14) are available for serving water and alcoholic beverages. Decorative styles are also numerous. For example, over 25 different motifs were identified among the transfer printed decorations of fine English earthenwares (Fig. 5.15), and several of them are present on more than one object.

5.2 Porcelain plate rims with decorations enriched with gilding. The fragment on the right dates between 1810-1815 and 1830.

(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-159)

5.3 All pitchers, but how different! From left to right: buff earthenware with slip decoration; high quality bone china with moulded, painted and gilt decorations, circa 1820-1830; fine stoneware with moulded and applied decorations; red earthenware with deep bronze lustre, height: 13.5 cm.

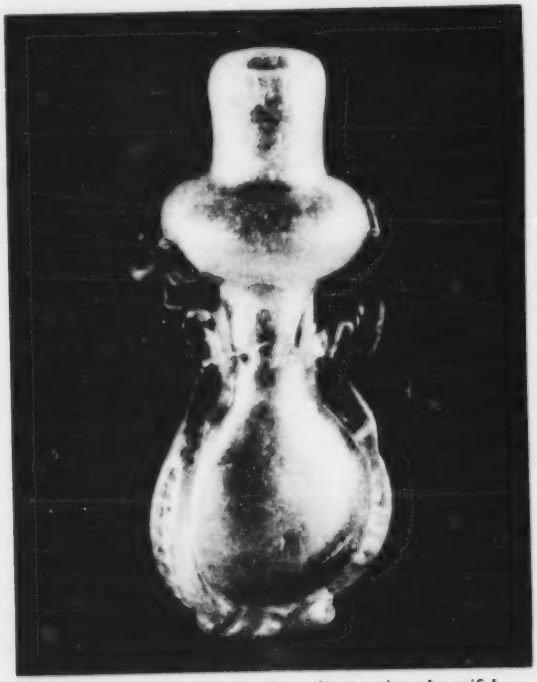
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-82)

5.4 Butter or dessert dish, or bottle holder. This shallow cylindrical container probably had an applied (gilt?) decoration on the Greek border. Diameter: 10.6 cm; height: 6.1 cm. Context: first half of the 19th century.
(Canadian Parks Service, photo: Jean Jolin, 38G-106/ACM/PR-6/P-134)

5.5 Animal foot in copper alloy. Height: 1.5 cm.
(Canadian Parks Service, photo: Jean Jolin, 38G-106/ACM/PR-6/P-113)

An impression of abundance is derived from an observation of the collection of objects found in the courtyard, the latrines, and the ash house. Nearly 690,000 artifacts, bones, shells, and plant macroremains, of which over 26,500 were ceramic fragments, were waiting to give us a glimpse of the site's and occupants' history. This phenomenon was particularly striking in the latrines, where some 240 fine English earthenware and porcelain objects were found. Several tableware service sets are represented by more than one fragment. Such a wealth of belongings is indicative of a well-endowed household.

5.8 From left to right: champagne bottle, beer bottle (stoneware), and wine bottle. Height of the body of the wine bottle: 13.1 cm, diameter: about 9.3 cm. Context: first half of the 19th century.
(Canadian Parks Service, photo: Jean Jolin: 38G-106/ACM/PR-6/P-98)



5.9 Did this flask contain smelling salts to revive a beautiful lady whose corset was too tight? (cf. McKearin and Wilson, 1978: 368-369). Height: 6 cm. Context: first half of the 19th century.
(Canadian Parks Service, photo: Jean Jolin: 38G-106/ACM/PR-6/P-117)

BEYOND THE INITIAL IMPRESSION

5.13 Rummer goblet with an inscription reading "1819" engraved with a diamond point (cf. Bickerton 1971: 7, 17, and Fig. 604). Height: 12.9 cm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-128)

In order to put to the test our impressions concerning the quality, variety, and quantity of the material remains collected in the southeast courtyard, the artifacts obtained in the latrines and ash house were used. The latrines were built in 1815, and demolished in 1854, while the adjacent ash house could have served to collect ashes and kitchen waste between 1816 and about 1850. The contents of the latrines of the house occupied by Major George A. Eliot between 1823 and 1831 were available for purposes of comparison.[2] This house was located to the east of Carrières Street and south of the Governor's Lower Garden.

We thought it useful to look at the contents of the ash house separately from that of the neighbouring latrines in most of our comparisons. On the one hand, we did not have the equivalent of the ash house, whose primary function was different from that of the latrines, in Major Eliot's house; and on the other, the calculation of similarity coefficients[3] between the three collections, in terms of the decorations found on the cups,[4] saucers, bowls, and plates made of fine English earthenware, placed the ash house in a relatively separate category (Table 1).

5.7 Undecorated tableware was the least expensive category. The pitcher in the shape of a barrel with broad engine-turned horizontal bands (cf. Campbell 1984: Fig. 87c) comes from the ash house; while the other objects were found in the neighbouring latrines. Diameter of the bowl: 16.1 cm.; height of the pitcher: 16.5 cm. Context: first half of the 19th century.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-80)

Monetary Value

In order to evaluate the quality of an object, price remains the most objective criterion. It generally depends upon the dynamics of supply and demand. In other words, it takes into account the scarcity of an object or the materials used to make it, combined with its desirability.[5] It relates to factors such as the availability of the raw materials, the method of production, the workmanship, the modalities and circumstances of distribution, and the geographic location of the production facilities or markets. It refers also to the needs and tastes of the consumers, who are in turn affected by marketing, fashion, as well as their social status and purchasing power.

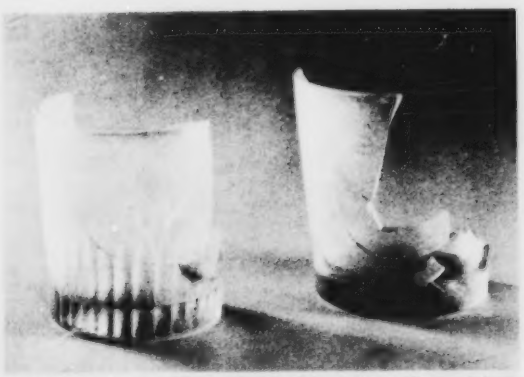
Data was insufficient to allow us to establish the real market value of the objects we wanted to evaluate. In order to be able to carry out some comparisons, however rudimentary, we decided to follow the price indices proposed by George Miller in his article entitled "Classification and Economic Scaling of 19th Century Ceramics."[6] Miller based these indices on documents such as price lists, invoices, account books, and bills of lading (receipts of goods shipped by sea) and the price of English white earthenware dishes during the course of the 19th century. Creamware, pearlware, whiteware, and stone chinas were at that time the main types of ceramics sold in the English and North American markets. Miller discovered that, apart from the shape of the object, it was the decoration that was generally responsible for variations in price.

According to Miller's study, the least expensive objects were the cream-coloured undecorated vessels. Their price was relatively stable during the 19th century. Also, the author formulated indices that could be used to establish, for each year for which data are available, the differences between the values of decorated fine earthenware dishes and undecorated cream-coloured tableware, to which he assigned an index of 1.[7] Since we have indices only for cups, saucers, bowls, and plates, these were the only objects used in the comparisons.

The undecorated cream-coloured tableware[8] which represents the bottom level in the Miller scale, was present in the three collections (Fig. 5.7). However, in the ash house, it was present in a proportion that was four times greater than in the collection obtained from the latrines in the southeast courtyard, and three times greater than in the collection found in officer Eliot's latrines (Table 2). This undecorated tableware represented 9% of the value of the ash house collection, while, in each of the latrines, it accounted for less than 3% of the value of the fine earthenwares.

A little above the tableware that has no ornamentation, we find the least expensive decorated pieces, that is, those whose minimal decoration — shell edge, sponge or slip motifs — required minimum skill on the part of the craftsman. Within this category, differences between our collections are less evident, but the ash house is once again isolated: the percentage of minimally decorated tableware found there was, in fact, clearly higher than in the other two

5.14 Decanters of the so-called Anglo-Irish period (1780-1825). Height of the one on the left: 28 cm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P92)

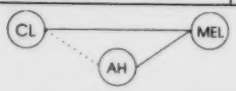


5.12 On the left, a goblet decorated with cut flutes. Height: 8.4 cm; diameter at the base: 6.7 cm (cf. McNally 1982: 93, and Jones 1985: 41). On the right, plain goblet. Height: 9.1 cm; diameter at the base: 7 cm. Context: first half of the 19th century.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-126)

The Similarity Coefficients

■ According to a Method Used by J.W. Wright

	Ash house	SE courtyard latrines	Eliot's latrines
Ash house	200		
SE courtyard latrines	152.52	200	
Major Eliot's latrines	162.68	172.24	200

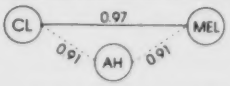


identical = 200
completely different = 0
mean = 162.48

■ According to a Method Proposed by J.A. Sher

Correlation between the contexts

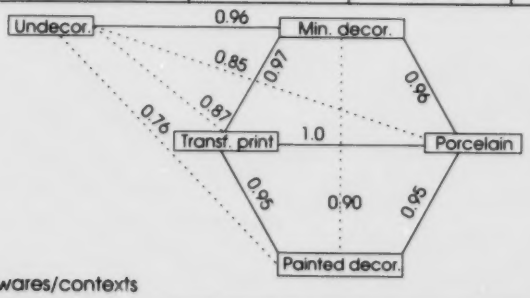
	Ash house	SE courtyard latrines	Eliot's latrines
Ash house	1.0		
SE courtyard latrines	0.9098	1.0	
Major Eliot's latrines	0.9079	0.9723	1.0



mean = 0.93
absolute similarity = 1.0

Correlation between fine earthenwares

	Undecorated	Min. dec.	Painted dec.	Transfer printed*	Porcelain
Undecorated	1.0				
Minimal decoration	0.9599	1.0			
Painted decoration	0.7602	0.9017	1.0		
Transfer printed*	0.8720	0.9705	0.9467	1.0	
Porcelain	0.8467	0.9562	0.9474	0.9985	1.0

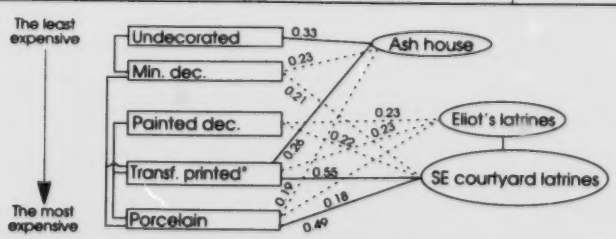


mean = 0.916
coincidence = 1.0

Correlation:fine earthenwares/contexts

	Ash house	SE courtyard latrines	Eliot's latrines
Undecorated	0.3329	0.1346	0.0926
Minimal decoration	0.2299	0.2147	0.1385
Painted decoration	0.0534	0.2182	0.2252
Transfer printed*	0.2604	0.5459	0.2283
Porcelain	0.1933	0.4917	0.1830

mean = 0.2362



* In this category, we included all the fine earthenware with transfer printed decorations, including willow, flowing blue, and ironstone china.

———— similarity coefficient higher than the mean
- - - - - - - - - - similarity coefficient slightly below the mean

Table 1

		ASH HOUSE		SE COURTYARD LATRINES		ELIOT'S LATRINES	
VARIETIES	**OBJECTS**	no.	%	no.	%	no.	%
Undecorated	no. obj.	13	21.31	9	5.03	3	7.14
	value	13.61	8.97	9.00	1.62	3.34	2.70
Minimum decoration:							
Shell Edge	no. obj.	5	8.20	9	5.03	5	11.90
	value	6.50	4.28	11.61	2.08	6.55	5.29
Slip	no. obj.	4	6.56	1	0.55	0	0
	value	5.00	3.29	1.25	0.22	0	0
Sponge	no. obj.	1	1.64	6	3.35	0	0
	value	1.30	0.86	7.20	1.29	0	0
Total	no. obj.	10	16.39	16	8.93	5	11.90
	value	12.80	8.43	20.06	3.59	6.55	5.29
Paint	no. obj.	2	3.28	14	7.82	7	16.67
	value	3.18	2.09	24.70	4.43	12.6	10.18
Transfer printed:							
Willow	no. obj.	3	4.92	6	3.35	0	0
	value	7.80	5.14	14.28	2.56	0	0
Others	no. obj.	19	31.15	60	33.52	16	38.10
	value	55.22	36.37	165.83	29.75	50.04	40.44
Total	no. obj.	22	36.07	66	36.87	16	38.10
	value	63.02	41.51	180.11	32.31	50.04	40.44
Flowing Blue	no. obj.	0	0	3	1.68	0	0
	value	0	0	7.95	1.43	0	0
Ironstone China	no. obj.	0	0	10	5.59	0	0
	value	0	0	34.80	6.24	0	
Porcelain	no. obj.	14	22.95	61	34.08	11	26.19
	value	59.20	39.00	280.80	50.38	51.20	41.38
Total	no. obj.	61	100.01	179	100.00	42	100.00
	value	151.81	100.00	557.42	100.00	123.73	99.99
Average value of a piece of table service		2.49		3.11		2.95	

* All cups, whether or not they had a handle, were taken into account. Consequently, the objects that were identified in the inventories and studies as small tea bowls were included in our calculations. When a cup and saucer matched, only one of the two objects was counted, since cups and saucers were entered together as a unit in the price lists

** The value of the objects was calculated on the basis of Miller's indices (Miller 1980: 26-35)

INDICES USED

- **Cups and saucers**: average of indices established for all cups — handled, unhandled, not specified.
- **Plates**: average of indices established for each format.
- **Ash House**: average of indices established for the years 1814 to 1846 inclusive.
- **Southeast courtyard Latrines**: average of indices established for the years 1814 to 1856 inclusive.
- **Major Eliot's Latrines**: average of indices established for the years 1814 to 1833 inclusive.

Table 2

locations. The proportion of the value of the contents of the ash house allocated to the minimally decorated objects was almost the same as in the case of the undecorated tableware. The similarities between the two latrines is not surprising. However, how can we explain the differences between the adjacent latrines and ash house in the Château's courtyard? Were the users different? Or could this be explained on the basis of the primary function of each site that would lead to the disposal of different types of waste?

The third level includes items embellished with painted motifs. These objects were generally a little more expensive than the preceding ones, because the artist must be sufficiently skilled to be able to reproduce the same decorative scene on all the pieces in the same table service. In the case of Major Eliot, this group was represented in about the same number as the minimally decorated dishes were in the ash house. It accounts for a proportion of the value of the collection that is greater than the share of the two less expensive tableware categories together. It may have been that this decorative technique was less appreciated by the users of the latrines and the ash house in the southeast courtyard, because the collection found in that site includes only a small percentage of painted pieces.

The fourth place belongs to the tableware decorated with transfer printed designs. Even though the difference between its price and that of cream-coloured fine earthenware was decreasing from the end of the 18th century to the middle of the next century, it remained, together with ironstone, the most expensive of the fine earthenwares, with the exception of porcelain. Our three collections reflect the popularity of this type of decoration among those who had the means to buy it. Almost 40% of the tableware found in each of the sites belongs to this category. The sums spent to acquire them represent from 32% to 41% approximately of the respective value of the three collections. However, the *Willow* motif, which was the least expensive, is printed on a certain number of pieces coming from the two southeast courtyard assemblages, while it is absent from that of Major Eliot's latrines.[9] Was this indicative of different tastes among people of comparable economic levels, or of the presence on the site of the Château of people who had a lower status or less purchasing power?

Several objects stamped *Patent Ironstone China* were found in the latrines of the southeast courtyard, but not in those of Major Eliot. Miller gives neither prices nor indices for this type of tableware. We know that in a 1814 sale, the price of the plates in a service of *Patent Ironstone China* with a transfer printed decorative motif that was probably the same as that of some pieces in our collection ("Blue Pheasants" pattern, Fig. 5.19), was, on the average, 30% higher than that asked at the same time for similar objects made of fine earthenware with a transfer printed decoration, other than *Willow*.[10] A diffuse blue decoration (*Flowing Blue*) was also present on a small proportion of the tableware found in the latrines of the southeast courtyard. In the middle of the 19th century, pieces decorated with diffuse colours were more expensive than those with transfer printed decorations.[11]

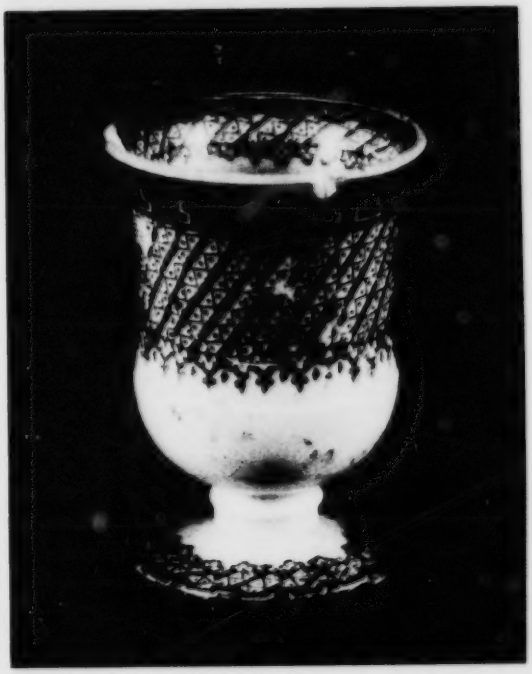
5.16 Minimally decorated tableware: on the front, slip-decorated cup and bowl made of refined white earthenware; on the back, pearlware plate decorated with a blue shell-edge, and wide cup with a deep saucer embellished with a blue sponged decoration. Diameter of the saucer: 17.5 cm. Context: cup on the left: middle of the 19th century; other objects: first half of the 19th century.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-73)

5.17 Creamware plate with a yellow and brown decoration painted over the glaze. Estimated diameter: 20.6 cm. Context: end of the 18th century – first half of the 19th century.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-106)

Miller did not include porcelain in his scale, because he did not have enough information on the various prices. However, as far as we know, this type of ceramic was more expensive than fine earthenwares with transfer printed decorations.[12] The latrines in the southeast courtyard contained a lot of porcelain. Over 34% of the collection found on this site was made of that material. In the ash house collection, the percentage for the same types of objects was close to 23%; while in Major Eliot's latrines, it was over 26%. However, in the ash house, cups, saucers and bowls reminiscent of tea sets, were responsible for such a high percentage of porcelain.

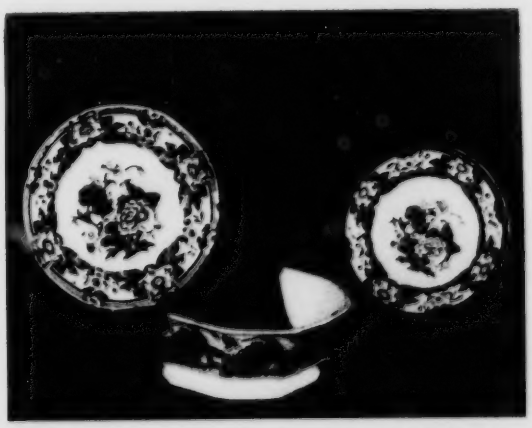
In officer Eliot's latrines, oriental porcelain predominates. Furthermore, no English bone china was found. Conversely, in the deposits of the Château's courtyard, most of the porcelain objects mentioned above were of English origin. Was it for economic or for political reasons that the Governor's household preferred products from the home country?

As we have seen, these few comparisons raise many questions. They demonstrate the presence of a significant proportion of objects belonging to the most expensive categories in the area located to the southeast of the Château. The average value of a piece in the collection recovered from the latrines in the southeast courtyard was higher than that of a piece unearthed in Major Eliot's latrines (Table 2). However, our research also indicates the presence, particularly in the ash house, of a significant percentage of lower quality objects. For example, a piece of the collection found in this location costs, on the average, 20% less than a piece from the neighbouring latrines. The relative position of the three sites in the socio-economic scale confirms the results of the Sher graph model (Table 1). If we put together the objects obtained in the latrines and in the ash house in the southeast courtyard of the Château, the average value per piece remains higher, even though only slightly, than that of a comparable piece recovered from Major Eliot's latrines.



5.6 Egg cup with a blue transfer printed decoration. Height: 7.1 cm. Context: middle of the 19th century.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-120)

5.18 Cup and saucer in pearlware with polychrome painted decorations. Diameter of the saucer: 14.6 cm. Context: first half of the 19th century.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-124)



5.19 Some of the ironstone china pieces decorated with the Blue Pheasants pattern (1813-1825) (cf. Godden 1980: 123-128). Diameter of the large plate: 24.5 cm; height of the soup tureen or vegetable dish: 8.9 cm, width at the top: 21 cm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-71)

Variety

It was not possible to compare the three collections accurately from the point of view of shapes. We will simply mention that when we take into account the sizes of the objects — plates of various sizes normally indicate different functions — the fine earthenwares and porcelains found in the latrines in the southeast courtyard of the Château Saint-Louis present the widest variety. For example, in Major Eliot's latrines we found three sizes of plates; that is, about 25, 22, and 16 cm; while in the latrines in the southeast courtyard, we found an additional size (about 18 cm). The latter also contained bowls of two different sizes (13 and 16 cm), cups with rounded walls, and with and without handles, measuring from 8.5 to 12 cm in diameter, as well as cups with vertical walls suitable for the needs of children.

More than twenty different patterns were present on the transfer printed fine earthenware found in the latrines of the southeast courtyard. Several patterns were parts of sets. Twelve decorations were used on more than one fragment. Thus, twenty-seven plates were in the Village Church Pattern. Another service, in porcelain this time, includes thirty-one plates, soup plates, and small plates.

5.15 Plates and serving platters with blue transfer printed decorations as follows: *Willow* (1780-) (on the left), *Village Church* (circa 1820-1835) (on the right), and *Dromedary* (circa 1814-1828) (cf. Coysh 1974: Figs. 73 and 150). Length of the platter: 31 cm.

(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-135)

Weight of Numbers

When comparing collections, it is difficult to interpret the weight of numbers. The number of objects present in a collection is not only a reflection of the wealth or income of a household. It may also be an index of its size, residential stability,[13] and cleaning habits and activities.

The latrines in the southeast courtyard of the Château contained 2.82 times, and the adjacent ash house 1.25 times more objects of fine English earthenware and porcelain than the latrines of the neighbouring house inhabited by Major Eliot, despite the high social status of the latter. It may be that this difference can be explained not only on the basis of a longer period of occupation, but also by a larger number of users. Moreover, the latrines in the southeast courtyard were at least twice as large as Major Eliot's privy, which had a capacity that was closer to that of the ash house. Furthermore, theoretically at least, a more modest family would have fewer possessions and therefore, in absolute numbers, a waste production potential that would be more limited than a wealthy household of the same size.

As for residential stability, its effect on the quantity of objects found in the southeast courtyard is a complex one. A household occupying a site for many years, like that of the Eliots, should in the absence of other factors leave more traces than another, that of a Governor for example, who stays for a shorter period of time. However, when a Governor leaves, the site is not abandoned: some users of the site remain and another Governor's or administrator's household comes in, so that the traces of the new occupants are superimposed or mixed with those left by the old. Moreover, it is possible that a house where the occupants

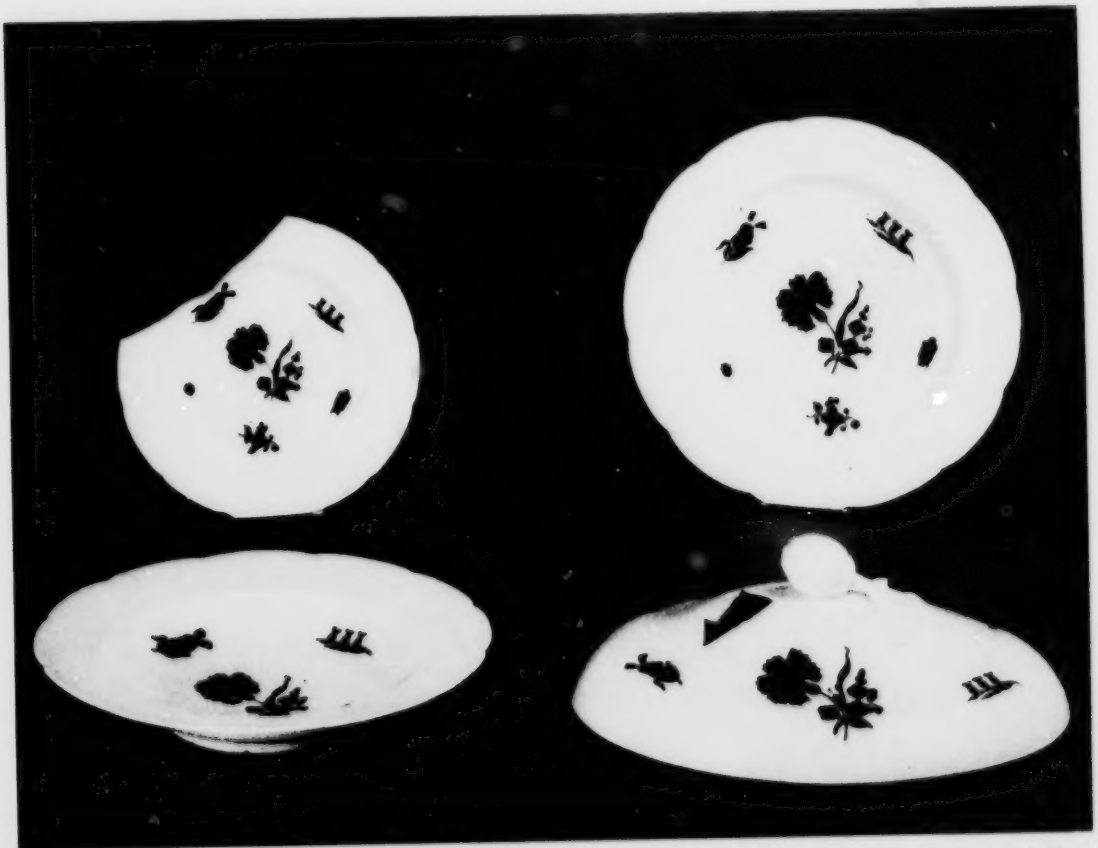
5.11 Wine glasses of various shapes and sizes. Context: first half of the 19th century.

(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-108)

succeed each other at a fast pace would produce more waste than one where the occupants are more stable.

Finally, refuse pits such as those found in latrines and ash houses, are characterized by the fact that they are occasionally emptied. If in one site this operation removes a significant proportion of the objects, it would become more difficult to compare it to another that has not been emptied, in order to arrive at a conclusion regarding the social status of the users. Furthermore, because of their conservative attitudes and undoubtedly because their possessions are generally more expensive and durable, the rich would dispose of a smaller proportion of their possessions than people of lesser means. Also, in order to establish valid comparisons between the collections in terms of the total number of objects, we should attempt to neutralize the effect of these variables on the quantities found.

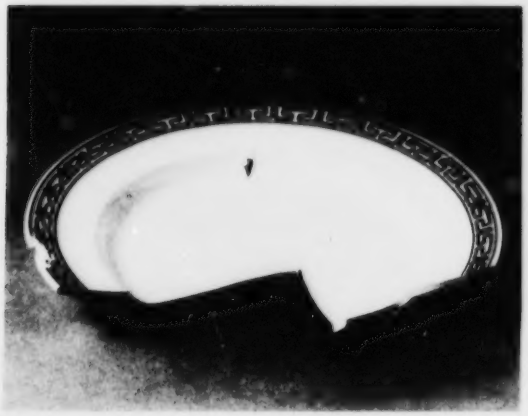
5.10 Good-quality painted English porcelain breakfast set (Meissen copy) associated with the better households. Diameter of the plate: 19.2 cm. Context: first half of the 19th century.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-88)



5.20 Porcelain with a decoration similar to the "brindille" embellishment created in Chantilly, France, and imitated, among others, in Derby, England (circa 1790-1820) (cf. Brayshaw Gilhespy 1965: Fig. 81). Diameter of the large plate: 24.7 cm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-79)

THE POTENTIAL USERS

Who were these people whose activities may have left traces in the area located to the southeast of the Château Saint-Louis? As we will see, they did not all have the same purchasing power.



5.21 Porcelain plate decorated with a blue Greek border. Diameter: 24 cm. Context: first half of the 19th century.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-118)

5.22 Cups and teapot cover in bone china decorated with pink lustre (circa 1810). Height of the cup on the right: 5.7 cm.
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-157)

THE MASTERS

Even though the Governor and his family may not have often frequented the muddy pathways of the lower courtyard, their perishable foodstuffs and their containers were all likely to have spent some time in the icehouse. As the kitchen of the Château was located close by, it is quite probable that at least some of the chipped tableware and kitchen waste would have ended up in the latrines, the courtyard, and the ash house.

Four Governors and six Administrators succeeded each other in the Château Saint-Louis, between the time of the construction of the latrines and the ash house in the southeast courtyard, and the fire in the vice-regal residence that took place in 1834. Undoubtedly, it would be easy to remember John C. Sherbrooke, Charles Lennox, George Dalhousie, and Matthew Aylmer, even if people like Drummond, Wilson, Monk, Maitland, Burton, and Kempt, who were there during the interims, are less readily recalled.[14] In front of the old official residence, the Château Haldimand would remain in use by the government under Gosford, Durham, Colborne, and Thompson. In 1841, however, it was already occupied by the Corporation of Québec.[15]

At the beginning of the 19th century, the Governor General in residence received, according to John Lambert, a salary of 4,000 pound sterling per year;[16] that is, over ten pounds per day; and quite often, he had some family fortune. Undoubtedly, he had to face many expenses, not only in Great Britain, where he left behind properties and often children, but also in the colony, in his position both as representative of the King and for personal reasons. Upon his arrival, for example, it was customary that he purchase the furniture of his predecessor. In his journal, Lord Dalhousie complained that the Governor had to spend 5,000 pounds even before laying hands on a single shilling from his salary or benefits.[17] Lady Aylmer

was also eloquent in the same sense: "We purchased every thing that Sr James Kempt left, [...], which, as every article of old furniture was appraised at an enormous price, we were nearly ruined."[18] Which was undoubtedly an exaggeration! The standard of living of those people could not be compared to that of the lower classes. They lacked no resources to meet the needs and whims of daily life, nor to finance splendid official or private parties. It was under Dalhousie's administration that the greatest number of balls, almost always accompanied by a meal, were given at the Château.[19] At the same time, the dramatic situation described by Lady Aylmer seems quite short-lived if we take into account, among other things, the amount of time and effort that she spent in interior decorating.[20]

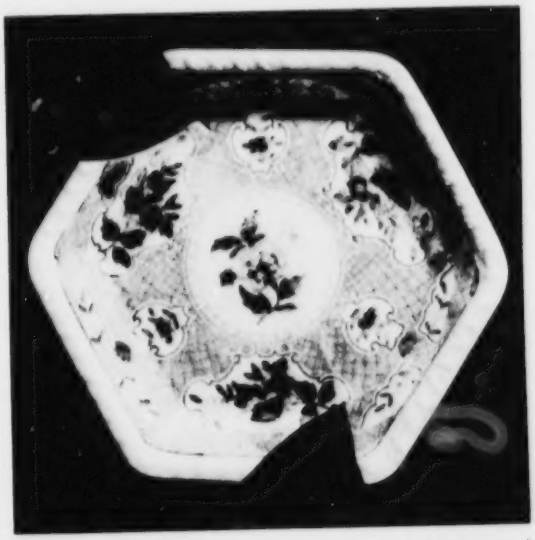
THE SERVANTS

Domestic servants, skilled workers, and day-labourers were among the regular or occasional users of the outbuildings and the courtyard. They included kitchen staff, household servants who had to work in the nearby laundry, the carpenter hired to repair the icehouse or the woodshed, or even the labourers hired to help the gardener in his numerous spring jobs. All these people may have lost or thrown out things on the site, whether a button, a tool, or the remains of a meal; or even have used the latrines.

Even though this is difficult to estimate, it seems that the salaries of domestic servants in Québec and Montréal at the beginning of the 19th century were not bad.[21] In the capital, between 1816 and 1820, single men working as house servants earned, on the average, about 19.6 standard pounds per year; unmarried females, 9.4 standard pounds; couples, 38 standard pounds; and men who carried out two jobs, 39.4 standard pounds.[22] Moreover, the servants were generally provided with room and board.

In 1831, Lady Aylmer wrote that the salaries paid to domestic servants were very high in Canada.[23] Evidently she was not comparing their pay with that of her husband! However, it is difficult to know if she was comparing it with what she paid elsewhere before, with what her friends had to pay in Great Britain, with what people in the same condition earned here, or with her own estimate of the worth of the work. The Governor's house was served mainly by Irish domestics. Lady Aylmer hints at the fact that this was because Canadian domestics did not like to live with families where there were Irish servants. When she mentions their high level of pay, she may have been alluding to the great poverty of the masses of immigrants that arrived here by the boatload.

According to historian Claudette Lacelle, all things considered, Québec domestic servants, at least in the case of men, didn't need to envy other workers or day-labourers of the time in terms of their salaries.[24] Between 1815 and 1820 the workers hired by the Château Saint-Louis were paid about two shillings per day, or one-tenth of one pound. The painters, blacksmiths, and carpenters were also paid less than the masons, who earned over 5.5 shillings per day.[25] By 1855, the daily salary of labourers had only tripled, and that of masons had a little less than doubled.[26] These workers and day-labourers had to meet all their needs and were affected, particularly during the winter, by price increases, salary cuts — since the working day was shorter — and unemployment.[27]



5.23 The transfer printed polychrome decoration on this hexagonal serving platter was retouched with a brush. Width from one side to the other: 19.4 cm.

(Canadian Parks Service, photo: Jean John, 38G-106/ACM/PR-6/P-164)

WHAT ABOUT THE GARDENER?

The gardener hired by the government to maintain the Upper and Lower Gardens was also a frequent visitor to the site. There, he looked after the first greenhouse built in 1781, and then after the one built in 1815. He undoubtedly used the shed built between the icehouse and the greenhouse as a workshop and facility to store garden tools and utensils. The gardener could have been responsible for looking after the icehouse, as was the custom in England.[28] After the fire that destroyed the Château in 1834, he maintained his household in its former kitchen. Traces of the gardener's presence could have been found all over the entire occupied area.

It was under the Earl of Gosford, during part of the summer of 1835, that Richard Clancy started his career with the Governor. He was rehired as assistant gardener the following summer, and Captain Clements asked him to sleep at the Château Haldimand, so that he could look after the house during the three months that the Governor and his family would be in Montréal. The trust put on him did not prevent this bachelor from being fired at the end of the fall, when there was no longer any work for him. However, he would be rehired regularly in order to help the head gardener, until 1841, when he was put in charge of the Lower Garden of the Château.[29]

At that time, Clancy was forty years old. On 16 February of the same year he married a young 19-year-old girl, Margaret Feore, an Irish Catholic like him, in the Notre-Dame Parish of Québec.[30] Was it at that time that the household was installed in the former kitchen of the Château Saint-Louis near the southeast courtyard? In 1843, John Phillips provided an estimate of the repairs needed in a house "occupied by the Person in charge of the Gardens at the Castle of St-Louis."[31] Some wonder, at that time, how the occupants had not died of cold. Were these the Clancy couple and their first baby? One thing we know for sure, the Clancy family was living there when Joseph Archer carried out repairs during the following year.[32] Of the eight children that the Clancys had baptized,[33] five were born while they were living in the southeast courtyard of the Château Saint-Louis. They only left the place when the building they occupied had to be demolished for the extension to the Durham Terrace in 1854.[34]

In 1845, the City of Québec, to which the government had ceded the public buildings in the sector, gave Richard Clancy the job of keeping and maintaining the two gardens. The agreed upon annual salary, 20 standard pounds (18 pounds sterling) was low in comparison with what the gardener had been paid the previous year, when he was only looking after the Lower Garden.[35] In the fall of 1844, the government owed him 54 pounds 16 shillings for 274 days of work between the 1st of January and the 30th of September, at a rate of 4 shillings (3.6 s sterling) per day.[36] It may have been that, even though Clancy was officially paid "as Gardener to the Château," he was in fact carrying out two jobs, as in the colony it was possible to be a gardener and a domestic servant at the same time.[37] Moreover, Edward McCawley, his main competitor, did not ask for more since, in his tender, he asked for an annual salary of

5.24 Silver spoon. Front: monogram consisting of the letter "D" surmounted by the crown of an English Earl (the Earl of Dalhousie?); back: engraving with the profile of George III (duty mark), the Sheffield crown (town where the object was made), the letter I (year of manufacture: 1818-1819), and a lion passant (country of origin: England) (cf. Wyler 1976 [1937]: 86, 125, 200). Length: 13.9 cm.

(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-138,P-140, P-146)

23 pounds 17.5 shillings to do the same job.[38] Finally, apart from his salary, Clancy was given the use of a house, and all the products of the fruit trees and vegetable garden.

THE ACQUISITION OF GOODS

Undoubtedly, with the exception of the Governor and his family, the users of the latrines and the ash house would not have had the means to acquire goods of the quality, variety, and quantity represented by the recovered artifacts. But why could the less wealthy not have acquired some luxurious objects new, or second-hand because they were already used, no longer needed, or imperfect? Contact between the gardener, the domestic servants, the workers and the wealthier occupants may have encouraged the acquiring of new tastes for foods, clothing, or goods that were less familiar or accessible, and incite the "servants" to imitate the masters. In 1805, in the surroundings of the Château, in the Upper and Lower Towns combined, there were eleven second-hand goods and left-over food dealers.[39] The poor and the less poor could therefore have been able to choose from time to time a choice piece among the food scraps and other goods sold by these humble sellers. Imperfect objects were also available, since we found a hexagonal serving platter where the transfer printed decoration was badly applied, and was retouched with a brush (Fig. 5.23). Thus, some of the "luxury items" found may never have been owned by the Governor.

There was undoubtedly no need for some of those that frequented the site to go through these outside middlemen to find themselves in the possession of a yearned-for plate or leg of mutton. For example, the small silver spoon with Dalhousie's monogram that was found in the latrines (Fig. 5.24) may have been given by the Governor himself to a member of the house staff on some special occasion. Some domestic servants may have also received certain goods as an inheritance.[40] There was nothing to prevent the Governor or a member of his family from making a formal or less explicit gift of a possession that was no longer of interest to them, such as left-over food, a spoiled dish, or a table service that had no longer enough pieces to meet his needs, a cracked platter, or an object where the decoration was damaged, used clothing, outmoded belongings, or simply things they no longer liked. The kitchen and household staff could, in many cases, have taken care of the surplus, with or without the explicit consent of the masters of the house. They could probably have taken them to the secondhand clothing or food scrap merchants, but they could just as well have given them or sold them directly to the gardener or other employees of the Château, or even used them themselves. The last two solutions would have increased the possibility that the debris of these possessions would one day be found on the site.

The more modest objects in the collection might not have been necessarily bought by domestic servants, workers, or the gardener. Some, like the preserves pots, and the bowls used in the preparation of food, form part of items bought both by the wealthy and by the less privileged classes. Other objects could also have been bought by the Governor for the use of his employees.

As a whole, the artifacts found in the area located in the southeast courtyard of the Château Saint-Louis reflect a well-endowed, privileged socio-economic level. Our intuitions concerning the quality, quantity, and variety of the assemblages was confirmed. Of the potential users of the site, the Governor was undoubtedly the one who was best able to purchase the objects in their entirety. However, we should not conclude that each item was bought by him or for his own use. On the one hand, other people who frequented the site may also have acquired so-called luxury goods; and on the other, some of the less expensive items, apart from those that are used at all levels of society, could bear witness to their standard of living, even in the case where they were not bought by them. In this context, it is probably more appropriate to think that the collection in the southeast courtyard bears witness mainly to the overall life at the Château rather than that of its masters alone. Let us see whether other analyses of archaeological material, particularly food remains, confirm or deny this impression.

M. E. ■

NOTES AND REFERENCES • CHAPTER 5

1. Catherine Yasui and Ariane Burke, "An Analysis of Faunal Remains From the Château St-Louis Courtyard Privy, Québec City, Québec (1815-1854)," manuscript on file (ZIC, National Museum of Natural Sciences, Ottawa, 1987), to appear in the Microfiche Report Series, Canadian Parks Service, Ottawa, p. 34.

2. Inventory of Artifacts (1981), and Monique Laliberté, *Etude des artefacts provenant des latrines de la maison occupée par George Augustus Eliot ca 1823-1831*, Microfiche Report No. 80 (Parks Canada, Ottawa, 1983).

3. J.W. Wright, cited in Marcel Moussette, *Analyse du matériel céramique du site acadien de Beaubassin (Opérations 7B1 à 7B8)*, Manuscript Report No. 117 (Parks Canada, Ottawa, 1970), p. 184; Jacques Guimont, "La théorie des graphes, un instrument d'analyse archéologique," unpublished manuscript (Québec, 1985).

4. For the purposes of this study, "cup" means a small container used to drink, whether or not it has a handle or ear (cf. C. Arminjon and N. Blondel, *Objets civils domestiques: vocabulaire*, Paris, Imprimerie nationale, 1984, p. 192, note 1).

5. Steven Judd Shephard, "Status Variation in Antebellum Alexandria: An Archaeological Study of Ceramic Tableware," Suzanne M. Spencer-Wood, ed., *Consumer Choice in Historical Archaeology* (New York and London, Plenum Press, 1987), p. 166.

6. George L. Miller, "Classification and Economic Scaling of 19th Century Ceramics," *Historical Archaeology*, Vol. 14, 1980, p. 1-40.

7. *Ibid.*, p. 11; in Appendix D of *Archaeology at Fort Chambly (1760-1940)* (Microfiche Report No. 280 [Parks Canada, Ottawa, 1986], p. 370-382), the author, Francois Miville-Deschênes provides a good review in French of Miller's method.

8. For the purposes of this study, tableware includes cups (handled and unhandled) and saucers, as well as bowls and plates of all sizes, including soup plates.

9. Only one serving platter has this decoration.

10. Geoffrey A. Godden, *Godden's Guide to Mason's China and the Ironstone Wares* (Woodbridge [England], The Antique Collectors' Club, 1980, new revised and expanded edition of the volume published by Barrie & Jenkins in 1971), p. 125-126; G. L. Miller, *op cit.*, p. 24.

11. G. L. Miller, *op. cit.*, p. 29, 32, 35.

12. *Ibid.*, p. 4, 32.

13. S.J. Shephard, *op. cit.*, p. 166.

14. It is difficult to determine precisely what activities were carried out on the site during this interim period, or even during the holidays or often extended travels of the Governor. The Duke of Saxe-Weimar Eisenach, who visited the Château Saint-Louis when passing through Québec, reports that the residence was empty during the absence of the Earl of Dalhousie (Bernhard, Duke of Saxe-Weimar Eisenach, *Travels Through North America, During the Years 1825 and 1826* [Philadelphia, Carey, Lea & Carey, 1828], Vol. 1, p. 92). On the other hand, the fact that the Aylmers had bought all the goods left by Sir James Kempt, from meat to furniture and from cows to porcelain, may mean that the latter was living in the Château before the arrival of his successor (L.A. Aylmer, 24 February 1831, "Recollections of Canada," *Rapport de l'archiviste de la province de Québec* [hereafter *RAPQ*] *pour 1934-1935* [Québec, Rédempti Paradis, 1935], p. 292-293).

15. C. Chartré, J. Guimont, Y. Laframboise and G. Pelletier (Ethnotech), *Évolution historique de la terrasse Dufferin et sa zone limitrophe de 1838 à nos jours*, Microfiche Report Nos. 29-30 (Parks Canada, Ottawa, 1981), p. 60.

16. John Lambert, *Travels Through Canada and the United States of North America in the Years 1806, 1807, & 1808* (London, C. Cradock and W. Joy, 1813, 2nd corrected and improved edition), p. 208.

17. George Ramsay, 9th Earl of Dalhousie, in *The Dalhousie Journals*, ed. Marjory Whitelaw (Ottawa, Oberon Press, 1981), Vol. 2, p. 26.

18. L.A. Aylmer, *loc. cit.*

19. Jacques Guimont (Ethnotech), *Étude sur l'évolution historique du secteur du Château Saint-Louis et de sa zone limitrophe de 1760 à 1838*, Microfiche Report No. 45 (Parks Canada, Ottawa, 1983), p. 92.

20. L.A. Aylmer, *op. cit.*, p. 293, 305, 313-314, 316, 318.

21. Claudette Lacelle, *Les domestiques en milieu urbain canadien au XIX^e siècle*, Studies in Archaeology, Architecture and History (Environment Canada - Parks, Ottawa, 1987), p. 51.

22. *Ibid.* Halifax currency: 1 standard pound = 0.9 pound sterling (A.B. McCullough, *Money and Exchange in Canada to 1900* [Toronto and Charlottetown, Dundurn Press, 1984], p. 292).

23. L.A. Aylmer, *op. cit.*, p. 295.

24. C. Lacelle, *op. cit.*, p. 52.

25. National Archives of Canada (hereafter NAC), RG1, E15A, Vol. 269. In 1810, it was possible to buy a four pound white bread or a six pound whole-meal bread at a market price of one shilling (*Gazette de Montréal*, 5 February 1810; Y. Desloges, pers. comm.).

26. *Ibid.*, RG11, Vol. 22, f. 25160.

27. Jean Hamelin and Yves Roby, *Histoire économique du Québec 1851-1896* (Montréal, Fides, 1971), p. 24-25.

28. John Claudius Loudon, *An Encyclopaedia of Gardening* (London, Longman, Orme, Brown, Green, and Longmans, [1846], new improved and expanded edition, foreword by J.C.L. [1834]), p. 611.

29. Archives de la Ville de Québec (hereafter AVQ), Conseil et Comités, dossier Château Saint-Louis.

30. Archives nationales du Québec à Québec (hereafter ANQ-Q), Register of the Notre-Dame parish of Québec, 16 February 1841.

31. C. Chartré, J. Guimont, Y. Laframboise, and G. Pelletier (Ethnotech), *op. cit.*, p. 79, 181.

32. NAC, RG11, Vol. 4, No. 5588, 19 October 1844.

33. ANQ-Q, Registers of the Notre-Dame of Québec and St. Patrick's parishes.

34. They would then move to a new house built for the gardener in the former location of part of the wall of the Lower Garden, near the Château Haldimand (C. Chartré, J. Guimont, Y. Laframboise, and G. Pelletier [Ethnotech], *op. cit.*, Figs. 123-124).

35. AVQ, Conseil et Comités, dossiers parcs, Agreement between Richard Clancy and the Corporation of Québec, 2 April 1845.

36. At a rate of 111.11 pounds Halifax currency for 100 pounds sterling (A.B. McCullough, *op. cit.*, p. 289), NAC, RG11, Vol. 4, No. 5558.

37. C. Lacelle, *op. cit.*, p. 51.

38. AVQ, serie travaux publics, dossiers administratifs, soumissions, 24 March 1845.

39. Abbé Joseph-Octave Plessis, "Les dénombrements de Québec faits en 1792, 1795, 1798 et 1805," *RAPQ pour 1948-1949* (Québec, Rédempti Paradis, [1949]), p. 157-190.

40. C. Lacelle, *op. cit.*, p. 80.

Chapter 6

ALIMENTARY, MY DEAR WATSON!

An Analysis of Faunal Remains from the Southeast Courtyard of the Château Saint-Louis*

Darlene Balkwill

On a cool spring evening in late April 1824, Lord and Lady Dalhousie presided over a lavish banquet at the Château Saint-Louis, the residence of the Governor-General. They had invited seventy-five guests including the Protestant and Catholic bishops, officers of the Royal Artillery Regiment, and several wealthy local merchants, to dinner and a ball to celebrate St. George's Day. As Lady Dalhousie surveyed the guests at the table, she reflected that the meal seemed to be a success, although it had gotten off to a shaky start — the oysters from Chaleur Bay had not been quite as fresh as one would have liked. However, the salmon had been very good, and the cook had devised a delicious new stuffing for the turkeys, using sausages and mussels. All the guests apeared to be enjoying the roast suckling pig, the succulent leg of lamb, and the tender haunch of veal.

Across the courtyard, the gardener sat down to his much simpler meal of pigeon pie. He was looking forward to tomorrow's supper, when he would be eating oysters, lamb, and veal left over from the Governor's banquet. He was fortunate that his sister was a servant in Lord Dalhousie's household and able to pass these delicacies on to him. They would taste particularly good after all the fish he had eaten during Lent; he was heartily sick of tommy cod and herring. As he relaxed at the end of a hard day's work, he enjoyed the peaceful scene. His wife was just returning from the chicken house with two fresh eggs for tomorrow's breakfast. A few cows lowed softly nearby as they waited to be milked, and a cat crossed the courtyard carrying a rat it had caught near the feed store. A young dog slept by the fireplace, twitching occasionaly as it dreamt of the rabbits it would chase tomorrow.

While this is a fictional account, it is based on fact. It is an interpretation of clues found in animal remains recovered from a single Dufferin Terrace deposit containing almost 40,000 animal bones, teeth, scales and shell fragments. These were sent to the Zooarchaeological Identification Centre, National Museum of Natural Sciences, in Ottawa. Here the bones were identified by Catherine Yasui and Ariane Burke by direct comparison with the Centre's extensive reference collection. Whenever possible, the name of the species, the element, the part of the body, and the age at death were recorded for each bone, along with any evidence of butchering, burning, or gnawing by carnivores or rodents.

Once all this data was recorded and entered into the computer, then began its analysis, that is, taking the basic facts and trying to flesh them out, to work backwards from a pile of bones to what people were eating and how they prepared their food in 19th century Québec City. A faunal analyst is a detective, using every possible clue to make the bones speak.

FROM GARBAGE TO KNOWLEDGE

The first step is to examine the relative bone frequencies. This procedure reveals the types of animals most commonly utilized as food (including milk) or as a source of other products such as fur, wool or leather. Interpreting bone frequencies is not simple; there are several techniques available, each with its inadequacies and limitations. Some analysts prefer to use the total number of bones, teeth, shells; this statistic is referred to as NISP, the number of individual specimens. The disadvantage of this measure is that certain bones are often highly fragmented or butchered, and so the animals from which they came tend to be over-represented in the sample. Other analysts prefer to work with an estimate of the minimum number of individuals (MNI) represented by the collection of bones; this is basically a very conservative estimate but suffers from the drawback that in a market-based economy, the proximal portion of two right

femurs probably does not represent two whole cows — it is more likely that these bones represent the purchase of a rump roast on two separate occasions. Despite the problems associated with these two measures (NISP and MNI), they can tell us a great deal about the types of meat people were eating in a particular place and time. Using both measures helps to alleviate the shortcomings of each, but we must still remember that these are only estimates, not hard facts.

The next step is to look at the proportions of wild and domestic animals. This gives insight into the stage of development of the economy, from heavy reliance on wild species to the highly developed urban economy depending almost exclusively on market purchases of meat from domestic animals.

Another stage in the analysis involves the determination of the age at death of the animals, especially in the case of domestic mammals. The age at death pattern can show whether these animals were raised primarily as a source of meat or for other products such as wool or milk. For example, if most of the pigs at a site were killed when quite young, while the majority of the sheep died as adults, we would conclude that pigs were raised for food, whereas sheep were raised for wool, then killed and eaten when they had outlived their usefulness as producers of wool.

The final stage involves examining the parts of the body which are represented by the bones, as well as any cut marks present on the bones. From this, we can determine how the animals were butchered and which cuts of meat were preferred. If contemporary meat prices are available from historical records, this information can sometimes be used to indicate the status of the occupants of the site. Wealthy occupants tend to leave traces in the form of a high proportion of bones from the expensive cuts of meat, whereas a poor family would probably leave an accumulation of bones from the most economical cuts.

SITE AND CONTEXT

The privy from which these bones were recovered is located in the southeast corner of the courtyard of the Château Saint-Louis. It is thought to have existed from around 1815 up to 1854, apparently escaping the fire which destroyed the Château in 1834.

It is extremely difficult, if not impossible, to determine the source of the domestic refuse found in the privy. Some of the glass and ceramic artifacts are of high quality and were no doubt originally owned by the Governor, although they may have been handed down to members of his household staff. The kitchen of the Château was located just to the north of the privy, so the food refuse could have come from there. On the other hand, the Château kitchen subsequently served as a house for the resident gardener during the 1840s and early 1850s. The bones may therefore represent the remains of the gardener's meals. The picture is complicated by the fact that the privy had on occasion been partially or completely emptied of its contents, thus disturbing the stratigraphy and obscuring the sequence of events. It was hoped that analysis of the faunal material would help to clarify the matter.

THE BONES SPEAK

The faunal sample recovered from the privy contains a total of 39,655 bone, teeth, and shell fragments. Vertebrates account for most (94%) of the remains, while shells from oysters, mussels and a scattering of other invertebrate species make up the remainder. Table 2 shows all the vertebrate species identified, and Table 1 lists the invertebrate species. These tables also give NISP, frequency of the total identified bone, and MNI count for each species; the percentage of total MNI is shown for each vertebrate species. Within each class (mammals, birds, fish, and reptiles), the species are listed in order of their relative abundance, with the most common first and the least abundant last. Overall, fish provide the majority of the vertebrate material, accounting for 68.79% of the bones, followed distantly by mammals at 18.02% and birds at 13.18%. The preponderance of fish bone is rather surprising, since one would expect the inhabitants of a city the size of Québec, with a population of 15,000 by 1821,[1] to rely largely on domestic stock for their meat. In fact, a stock of domestic animals was gradually established in Québec

Relative Abundance of Invertebrate Remains from the Courtyard Privy

TAXON	NISP	% IDENT. BONE	MNI
Gastropods			
land snail	10	0.64	10
freshwater pond snail	1	0.06	1
northern dwarf cockle	1	0.06	1
unidentified gastropods	1	–	–
Class subtotals	13	0.76	12
Pelecypods			
oyster	1,415	89.90	439
blue mussel	121	7.69	6
giant scallop	4	0.25	1
unidentified pelecypods	775	–	–
Class subtotals	2,315	97.84	446
Crustaceans			
bay/ivory barnacle	21	1.33	1
Echinoids			
common sand dollar	1	0.06	1
Total invertebrates	**2,350**	**99.99**	**460**

Table 1

in the early 1600s. Over the next two centuries, increasing urbanization and the spread of agriculture destroyed most of the nearby habitat of wild animals, forcing moose, caribou, and beaver further and further away from the city and making them less readily available. This loss was partially offset by the establishment of markets, where butchers could display their wares and the "Habitans", or country people, could bring their fruits, vegetables, meat, poultry, game. John Lambert's[2] description of the variety of goods available in market places in Upper Town and Lower Town in 1806 and 1807 shows that the market system was well established at this time. Lambert mentions beef, mutton, pork, veal, lamb, turkeys, chickens, geese, partridges, pigeons, wild doves, hares, and at least twelve kinds of fish, including trout, perch, cod, shad, and eel. Most of the animals mentioned by Lambert are represented in the faunal remains found in the courtyard privy.

Relative Abundance of Vertebrate Remains from the Courtyard Privy

TAXON	NISP	% IDENT. BONE	MNI	% MNI
Mammals				
sheep and sheep/goat	742	6.50	14	4.02
cow	593	5.19	8	2.30
pig	388	3.40	10	2.87
rat	100	0.87	8	2.30
cat	97	0.85	2	0.57
hare/rabbit	67	0.59	–	–
house mouse	31	0.27	7	2.01
snowshoe hare	19	0.17	4	1.15
dog	19	0.17	2	0.57
short-tailed shrew	1	0.01	1	0.29
unidentified mammal	19, 680	–	–	–
Class subtotals	21, 737	18.02	56	16.08
Birds				
chicken	784	6.86	23	6.61
passenger pigeon	160	1.40	13	3.74
domestic/passenger pigeon	132	1.15	11	3.16
domestic turkey	100	0.87	5	1.44
spruce/ruffed grouse	80	0.70	7	2.01
domestic goose	64	0.56	2	0.57
duck/goose family	61	0.53	3	0.86
mallard/black duck	55	0.48	5	1.44
domestic/Canada goose	37	0.32	4	1.15
Canada goose	18	0.16	1	0.29
domestic pigeon	5	0.04	1	0.29
barred owl	4	0.03	1	0.29
common snipe	2	0.02	1	0.29
cf. upland sandpiper	2	0.02	1	0.29
cf. golden plover	1	0.01	1	0.29
cf. blue-winged teal	1	0.01	1	0.29
cf. common goldeneye	1	0.01	1	0.29
veery/thrush	1	0.01	1	0.29
unidentified bird	846	–	–	–
Class subtotals	2, 354	13.18	82	23.59

Table 2

TAXON	NISP	% IDENT. BONE	MNI	% MNI
Fish				
herring sp.	4, 045	35.41	58	16.67
Atlantic herring	755	6.61	45	12.93
rainbow smelt	563	4.93	12	3.45
Atlantic cod	557	4.88	23	6.61
Atlantic tomcod	488	4.27	8	2.30
salmon/trout	297	2.60	5	1.44
haddock	232	2.03	6	1.72
yellow perch	227	1.99	6	1.72
lake/Atlantic sturgeon	146	1.28	11	3.16
brook trout	137	1.20	3	0.86
walleye and walleye/sauger	112	0.98	5	1.44
lake whitefish	36	0.31	2	0.57
capelin	35	0.31	1	0.29
cod/haddock	28	0.24	1	0.29
American eel	26	0.23	1	0.29
river redhorse	25	0.22	2	0.57
cisco/lake whitefish	22	0.19	3	0.86
striped bass	22	0.19	3	0.86
Atlantic salmon	21	0.18	1	0.29
sucker	18	0.16	2	0.57
arctic char/trout	16	0.14	1	0.29
redhorse	13	0.11	1	0.29
perch/bass	11	0.10	2	0.57
cisco	8	0.07	1	0.29
white sucker	6	0.05	1	0.29
lake trout	5	0.04	1	0.29
perch	3	0.03	1	0.29
American shad	2	0.02	1	0.29
longnose sucker	1	0.01	1	0.29
northern pike	1	0.01	1	0.29
alewife	1	0.01	1	0.29
unidentified fish	5, 348	–	–	–
Class subtotals	13, 207	68.79	210	60.36
Class uncertain	7	–	–	–
Total vertebrates	**37, 305**	**99.99**	**348**	**100.03**

Table 2 (continued)

DOMESTIC ANIMALS

Domestic mammals such as cow, sheep and pig provided a major portion of the diet. Although they make up only 15.09% of the identified vertebrate bones and 9.2% of the MNI count, they provide a far greater meat yield than do fish and chicken.

Cattle and sheep were the most important domestic food sources represented at the site. At least eight cattle were identified, ranging in age from very young calves up to fully adult cows. The presence of four calves less than three weeks of age is interesting; cut marks were found on some of the calf bones, indicating that these animals were used as food. However, today veal comes from animals at least one or two months old, since their meat is not considered palatable until then. In New York City during the mid-19th century, veal from an animal less than four weeks of age was not considered fit to eat, being described as "flaccid, gelatinous, and watery."[3] Lambert states that in Québec, "the veal is killed too young to please an English taste."[4] Apparently tastes in Québec City differed from those in London or New York, as well as from modern preferences.

The majority (59%) of the cow bones found in the privy come from the trunk and pelvic regions, which produce the choicest and most expensive cuts of beef, such as sirloin, rib roasts, and short loin. The limbs, which accounted for 14% of the bones, provide meat of lower quality and price. There are almost as many skull bones as limb bones; this may be due to breaking up of the skull in order to retrieve the brain and tongue. Foot bones and tail bones represent waste from primary butchering, during which the head, feet and tail are removed and the carcass is halved and quartered. Cut marks on the bones show that secondary butchering into roasts was accomplished by the use of saws, cleavers and knives. The cut surfaces on the sawn bones are fairly smooth and exhibit fine striae, indicating the use of a fine-toothed meat saw rather than a coarse-toothed saw. Saws, which were not adopted as butchering tools until the late 18th century, allow for more accurate cuts and individualized portions.

The presence of very young calves suggests that cattle were raised on the Château grounds, and the presence of butchering waste indicates that they were slaughtered on or near the site. A stable where these animals may have been housed is known to have existed on the property.

Lamb and mutton appear to have been more popular than either beef or pork; age data determined from the bones shows a preference for mutton over lamb. Bones from all parts of the sheep are present, suggesting that, like cattle, some sheep may have been raised and slaughtered at the site. Comparison of bone frequencies from the various regions of the sheep carcass shows that shoulder and loin roasts, as well as leg of mutton, were very popular. Bones from the head region are also well represented; after the brain and tongue were removed, the skull may have been used to make a nourishing and economical broth. The pattern of butchering marks shows that larger meat cuts such as roasts were commonly produced; however, the ribs and, to a lesser extent, vertebrae were sectioned numerous times, suggesting efforts to produce smaller cuts such as chops, riblets or stewing portions.

Pig bones are less common in the privy than either sheep or beef bones, but the butchering pattern is quite similar. It appears that no part of the pig was wasted. Choice cuts of meat from the back, sides, shoulder and leg are represented, with roasts and stewing portions favoured. The presence of a high proportion of bones from the head and feet may be attributed to butchering waste, but they may also indicate the consumption of pork hocks, pigs' feet, headcheese, pig cheeks, and tongue.

Bones were also recovered from two cats and two dogs, each of which was approximately five or six months old. Dogs and cats were commonly kept as pets. Dogs were often used for hunting and cats would be extremely useful in keeping down the rats, which were also common. Although there is no reference to the use of cats or dogs as food by this period of time, one cat forearm bone and one dog vertebra show cut marks; perhaps they represent the disposal of animals which had become nuisances. Latrines and abandoned wells appear to have been common repositories for dead pets during the 18th and 19th centuries.[5]

Although domestic mammals may have been the mainstay of the diet, domestic fowl, especially chickens, also played an important role. A minimum number of twenty-three chickens, five turkeys, two domestic geese, and one domestic pigeon are represented in the privy deposits. At least three of the chickens were roosters, as indicated by the presence of a spur on the tarsometatarsus of the leg. The chicken bones show that a range of sizes of chickens was present at the site; most would have been bantam size or a little smaller, but a few would have been as large as a modern-day leghorn. The variety of sizes and the presence of roosters suggests a breeding population raised on the Château grounds. The frequency of cut bones is low, indicating that most chickens were cooked whole, but the presence of cuts on some wing and leg bones shows that a few chickens had these parts removed before cooking.

Domestic turkeys and geese, which together account for only a small portion of the bones, may have been raised on the premises in a backyard flock, or they may have been purchased in the market. John Lambert commended the quality of Canadian poultry and mentioned that the turkeys were particularly hardy, frequently roosting the trees during the winter.[6] In the years 1806 to 1808, turkeys were sold in the marketplace in Upper Town for 3.5 to 5 shillings for a pair, while a dozen geese fetched prices from 2.5 to 4.5 shillings.[7]

WILD ANIMALS

Wild animals make up 75.83% of the identified vertebrate bone at the site. By far the majority of this is due to fish bones, which contribute almost 70% to the total. The predominance of fish bone suggests that fish made up the major part of the diet. However this is deceiving for two reasons. Firstly, fish have aproximately three times as many bones as do mammals and birds. Secondly, many of the fish bones recovered from the privy come from very small fish. Let us take rainbow smelt as an example; a total of 563 smelt bones were identified from at least twelve smelt, but this would only provide a good snack for a hungry man. In contrast, there are 593 bones from at least eight cows; these eight cows would provide a great many hearty meals for this same hungry man (assuming that the whole cow was used). In other words, the meat yield from domestic mammals is much greater than from fish, especially when the fish are small. Another factor to bear in mind is that fish often eat other fish, and some of the fish bones recovered from the privy may represent the stomach contents of other fish. Herring and capelin, for example, are the main food species of the Atlantic cod.

Despite these cautionary notes, it is readily apparent that fish provided the most important wild food resource and were eaten in great quantities. Relative bone frequencies and MNI estimates show that marine species such as Atlantic cod and herring were the most comon fish eaten. Fisheries located along the coast of the Maritimes and in the Gulf of St. Lawrence are known to have supplied fish to the Québec City markets.[8] While many of these shipments would contain salted fish, fresh fish were sometimes shipped on blocks of ice. John Lambert referred to the presence of both salted and fresh cod in the markets, and mentioned that "at some periods cod and salmon are as dear as in London."[9] At least twenty-three cod were present in the privy deposits; the majority of them are represented by head elements only, as the number of vertebrae recovered could account for only seven cod. The preponderance of head elements suggests the purchase of fresh rather than salt cod; salt cod usually contain only caudal vertebrae and a few head elements located just posterior to the gills.[10] Some of these may represent the deliberate purchase of cod head to make chowder. It is also possible that most of the head elements came from cod parts discarded during the cleaning of fresh cod; the vertebrae might have been disposed of later in a different area, or perhaps the cook had a favorite cat to whom were tossed the backbones.

Herring bones were also very abundant in the privy. These fish occur primarily in marine waters, but anadromous forms such as shad and alewife are found in fresh water during their spring spawning runs. During May and June large numbers of shad were taken in shoals of the St. Lawrence River from the Gulf to more than 20 miles above Québec City.[11]

Other marine fish represented in the sample include haddock, Atlantic tomcod and capelin. Bones from the capelin were probably undigested portions found in the stomach of a cod or herring. Both haddock and tomcod appear to have been more popular than any of the freshwater species, although less so than cod. During the winter, large quantities of tomcod, also known as tommy cod, were caught in the St. Lawrence River by ice fishing; they were readily available in the markets and a commonly eaten fish during Lent. Unsold tomcod were used to feed cattle.[12] The observance of Lent by Catholics living and working in the Château grounds may help to account for the preponderance of fish bones in the refuse deposited in the privy. "During Lent the French people live upon fish and vegetables."[13] So may have the Irish Catholics. If a large proportion of those in the service of the Governor were Catholic, the number of fish bones accumulated during a single Lent would be very high indeed.

The freshwater fish which occur in the faunal sample are present in relatively small quantities. Included in this group are the walleye, brook trout, lake trout, two kinds of whitefish, three species of suckers, yellow perch, and northern pike. Lambert mentions that "trout, perch, and other small fish are plentiful" and sturgeon, bass and "a large species of

eel are all favourite fish with the Canadians," but the walleye, also known as "pickerel or poisson dorée (sic), is reckoned the best that comes to market."[14] Of the species mentioned by Lambert, it is interesting to note that the walleye or *poisson doré* is one of the most abundant in the privy sample.

Considering the abundance and variety of freshwater fish available in the St. Lawrence River and smaller local rivers and lakes, the prevalence of marine species is rather surprising. Apparently in 19th-century New York City freshwater fish were considered "generally edible" but saltwater fish were "more nourishing and palatable."[15] From the number of marine fish bones found at this site, it would appear that at least some Québec City residents agreed with their New York counterparts.

Although fish were the most popular of wild food sources, wild birds also supplemented the diet. The marshes along the shore of the St. Lawrence River near Québec City were prime hunting grounds for shorebirds and migratory ducks and geese, and passenger pigeons were abundant during the summer months.

A total of 555 bones from wild birds were identified, making up 4.11% of the total. Passenger pigeons, ducks, and grouse are the most abundant, while wild geese and shorebirds are present in lower frequencies. There is one barred owl which may have been shot while attempting to raid the chicken coop.

In the 19th century passenger pigeons were hunted both for commercial sale and for private use, and were easily caught with the use of nets.[16] They were abundant in the region, although John Lambert observed that "the immense flocks that formerly passed over the country are now considerably diminished."[17] Pigeon meat from both wild and domestic forms was probably consumed by members of all social classes, since they were caught in great numbers and generally inexpensive to buy. Its popularity in the diet of the British military during the 18th and 19th centuries was observed at Coteau-du-Lac where two or three pigeons were consumed by each man at breakfast.[18]

Migratory waterfowl such as ducks and geese were commonly hunted in the marshes around Québec City. All of the duck species identified from the privy are nesting species within the area.[19] Spruce and ruffed grouse were probably hunted in the nearby countryside, especialy during the fall and winter, and may have been available in the markets as well. Small shorebirds such as plovers, sandpipers, and snipes may have served as common targets in sport hunting, with some being taken home for food. We know that a variety of small shorebirds were sold in New York markets during the 19th century;[20] probably similar birds were available in Québec City markets in the same period.

Of the vertebrate food resources, wild mammals appear to have made the least significant contribution to the diet. The only wild mammal food species identified is the snowshoe hare. Although hares were undoubtedly hunted, they were also available in the marketplace for 6d. to 9d. each.[21] Elements representing every portion of the body except the head were recovered, which suggests that the heads were cut off and discarded elsewhere; these bones may thus represent market purchases of dressed carcasses. It appears that the hares present in this sample were cooked whole since no cuts were observed on any of the bones.

Although wild game may not have been a popular source of food, imported foods such as oysters apparently were. Invertebrate remains are represented by a total of 2,350 shell fragments. The vast majority of the identified shell fragments are oyster. At least 439 oysters are represented. In the beginning of the 19th century, Lambert mentions that oysters were occasionally brought to Québec City from Chaleur Bay, "but so seldom, and in such small quantities, that an oyster feast is considered by the inhabitants as a very rare treat."[22] No doubt they were priced accordingly!

A total of 120 shell fragments of blue mussel and four from a giant scallop were also identified. Perhaps a frustrated oyster lover became curious about the other shellfish for sale at the market and purchased a few to try. The remaining invertebrates are considered incidental; the marine gastropod, barnacle, and sand dollar fragments may well have been found in the stomach of one of the haddocks, which are known to consume large quantities of molluscs, crustaceans and echinoderms.[23]

As Yasui and Burke point out in their report, "clearly the results of this analysis reflect a well-fed existence. The table fare was rich in variety, with meat from domestic livestock raised" on the Château grounds, some locally caught fish and wild birds, and seafood imported from the Atlantic coast. Mutton and beef appear to have been the most popular meats. Fish, especially marine fish, were commonly consumed and also popular. Chickens and turkeys, probably raised on the premises, were regular table fare. "Hunting for wild birds was primarily a seasonal activity probably spurred on by the sight of hundreds of migrating ducks and geese, but these birds, like small game," served to add variety rather than substance to the diet.[24]

Yasui and Burke conclude that although some of the faunal remains "seem to reflect the meals of the more wealthy occupants of the Château" (e.g. choice cuts of beef, expensive imported oysters and fresh marine fish), we cannot be sure that individuals such as a gardener did not have access to these same foods. "It is conceivable that a person in the

Governor's service may have reaped certain benefits like being given oysters or veal left over from a banquet, or enjoying some prime cuts of beef or mutton after the Governor ordered an animal slaughtered" for his own use.[25] In view of the fact that the privy was in existence from around 1815 up to 1854, the deposits may represent mixed accumulations over several decades. Even the large quantities of oysters present could have been consumed by either the Governor's household in a few meals or by the gardener over a number of years.

Despite the inability to assign the bones definitely to one source, it is apparent that the people in and around the Château ate very well. With livestock, chickens, and possibly turkeys kept in the courtyard, a marketplace offering dressed lamb and pork, imported fish and oysters, and an abundant supply of wildfowl, walleye, sturgeon and other fish in the nearby river, it seems clear that there was plenty to eat and no lack of variety.[26] And one can say almost as much concerning the vegetable side of things, without which a great table would remain incomplete.

D. B. ■

NOTES AND REFERENCES • Chapter 6

* This chapter was made possible by the research of Catherine Yasui and Ariane Burke, who identified and analyzed the faunal sample recovered from the privy. The discussion of the faunal results is largely based on a manuscript report written by Yasui and Burke in 1987. In particular, NISP and MNI counts, as well as data related to element distribution, cut marks, age of domestic mammals, size and sex of chickens, and some of the interpretation was taken from this report.

1 Craig Brown, ed., *The Illustrated History of Canada* (Toronto, Lester & Orpen Dennys Ltd, 1987), p. 260.

2 John Lambert, *Travels Through Canada and the United States of North America in the Years 1806, 1807, & 1808* (London, C. Cradock and W. Joy, 1813), p. 73.

3 Thomas F. De Voe, *The Market Assistant* (Detroit, Gale Research Company, 1975, new edition of the book published in New York, by Hurd and Houghton, in 1867), p. 60.

4 J. Lambert, *op. cit.*, p. 78.

5 Heather N. Nicol, "Bones From the Perthuis House Latrine at Place Royale, Québec (1682-1760)," manuscript on file (Zooarchaelogical Identification Centre (ZIC), National Museum of Natural Sciences, Ottawa, 1982); idem, *The Domestic Economy of Two Québec City Houses (1740-1830)*, Microfiche Report No. 53 (Parks Canada, Ottawa, 1982).

6 J. Lambert, *op. cit.*, p. 139.

7 *Ibid.*, p. 73.

8 Roch Samson, "Fishermen, Fishing Companies and Society on the Forillon Peninsula in the 19th century," *Research Bulletin*, No. 108 (Parks Canada, Ottawa, 1979).

9 J. Lambert, *loc. cit.*

10 S. L. Cumbaa, "An Analysis of Animal Bones From the 1696 Wreck of HMS Saphire, Bay Bulls, Newfoundland," manuscript on file (ZIC, National Museum of Natural Sciences, Ottawa, 1979).

11 J. Lambert, *op. cit.*, p. 76.

12 *Ibid.*, p. 77.

13 *Ibid.*, p. 72.

14 *Ibid.*, p. 77.

15 T. F. De Voe, *op. cit.*, p. 181.

16 *Ibid.*, p. 173.

17 J. Lambert, *op. cit.*, p. 78.

18 Karen Price, *Glimpses of Soldiering at Coteau-du-Lac, Québec, 1780-1856*, History and Archaeology No. 15 (Parks Canada, Ottawa, 1977).

19 W. Earl Godfrey, *The Birds of Canada* (Ottawa, National Museum of Natural Sciences, National Museums of Canada, 1986).

20 T. F. De Voe, *op. cit.*

21 J. Lambert, *op. cit.*, p. 73; 12 pennies equals 1 shilling.

22 *Ibid.*, p. 78.

23 A. H. Leim and W. B. Scott, *Fishes of the Atlantic Coast of Canada*, Bulletin No. 155 (Fisheries Research Board of Canada, Ottawa, 1966).

24 Catherine Yasui and Ariane Burke, "An Analysis of Faunal Remains From the Château Saint-Louis Courtyard Privy, Québec City, Québec (1815-1854)," manuscript on file (ZIC, National Museum of Natural Sciences, Ottawa, 1987), to appear in the Microfiche Report Series, Canadian Parks Service, Ottawa, p. 38.

25 *Ibid.*

26 *Ibid.*

Chapter 7

SEEDS OF HISTORY

Catherine Fortin

Why did we decide to keep the soil excavated from the privy under the Dufferin Terrace, once the thousands of artifacts and bones had been recovered? After all, this was nothing more than the thoroughly decomposed remains of human excrements. However, this indecorous material still contained thousands of remnants of fruits consumed almost two centuries ago. These remains are concrete evidence of certain activities of daily life, such as eating and sanitation, especially when one considers that before the installation of waste disposal systems, and the organized collection of household waste, latrines combined the functions of waste dump and privy. Consequently, plant remains in privies can be very important for the study of past ways of life.

PALEOETHNOBOTANY AND ARCHAEOLOGY

Plant remains, both pollens and macro-remains, can tell us about the regional and local vegetation prevalent in the past. While palynology (the study of pollens) is mostly useful in reconstructing paleovegetation and paleoclimates, paleoethnobotany attempts to find relationships between the species represented by plant macro-remains obtained in archaeological sites, and the human activities responsible for their presence. Plant macro-remains are plants or parts of plants that can be seen with the naked eye, and include fruits, seeds, leaves, or other elements that have resisted decomposition because they were burned or due to particular environmental conditions. In privies, one finds mainly seeds.* In such an environment, human beings are the main agents of deposition, which is not the case in large exposed areas, such as the Governor's garden, for example.

Paleoethnobotany may be used to study a large variety of sites and contexts: small industries, settlements, outbuildings, courtyards, drains, waste ditches, etc. In Europe and Asia, this discipline has been mainly used to retrace the history of domesticated plants, and to reconstruct prehistoric lifestyles. In Canada, it is only in the last ten years or so that the study of plant remains has formed part of archaeological work. Urban sites of the historical period, especially those in the old quarters of Québec City, are being increasingly analyzed from an ethnobotanical point of view.

What foods were consumed? Which of them were imported? In which proportion were cultivated and wild fruits used? In what way was the Governor's diet different from that of the gardener? What changes took place in the plant diet from one century to the next? How did human activities affect local vegetation? These are some of the problems that paleoethnobotany may help to solve.

A CONTINUOUSLY CHANGING FLORA

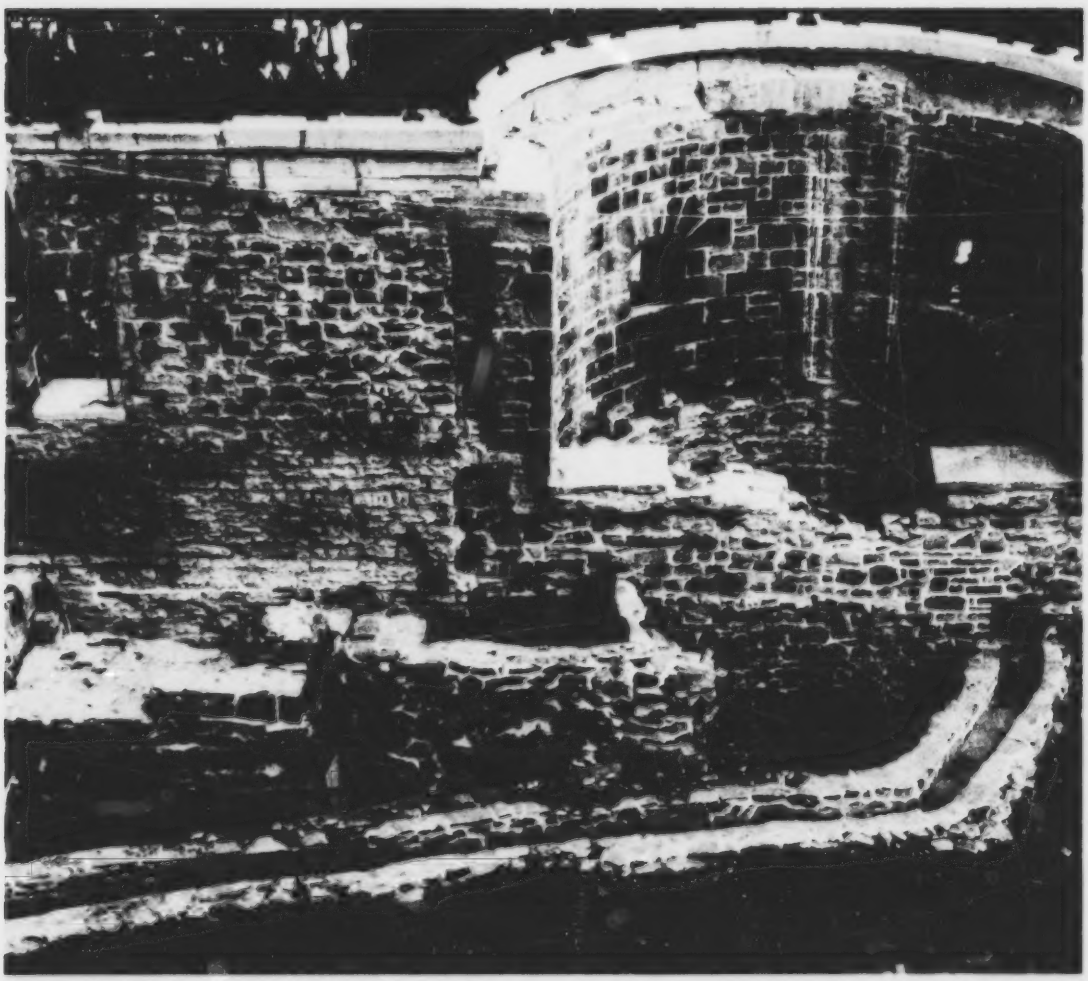
For a long time, Québec City occupied a strategic position in North America. Until the middle of the 19th century, it was the first port in the country: everything that arrived from Europe went through or stopped there. Consequently, it was also the way through which — accidentally or deliberately — plants were introduced, most of which became naturalized and found a foothold in the colony.

Very early in the history of Québec's urbanization, deforestation created a favourable environment for the introduction of adventitious plants.* Then and afterwards, the flora and vegetation suffered the impacts of residential, industrial, and port development, and were irretrievably changed. A study carried out in 1981 by the botanist Guy Baillargeon revealed that only three quarters of the original indigenous flora* of the promontory of Québec remains. Despite the disappearance of 155 of the 645 taxa* that existed at the time of the city's foundation, the local flora today includes some 865 species. Thus, Québec's flora is in a state of continuous change.

The area occupied by the Governor's residence and outbuildings did not escape the massive intrusion of allogenous plants.* There, as in the other heavily

populated quarters of the town, the large number of introduced plants* that have left remains reflects two centuries of intense human occupation.

Apart from the plants that spontaneously grew on the royal property, others were seeded or planted by the gardener. Some Governors were interested in the natural sciences, particularly botany. They sent living and dried specimens of Canadian plants to Europe, and introduced into the country new cultivated species in order to improve their menus and encourage agricultural and horticultural development. During his stay in Québec in 1749, the traveller Pehr Kalm, a disciple of Linnaeus, recognized in Governor La Galissonière a very knowledgeable naturalist. The latter is the author, with Jean-François Gaultier, a physician and botanist, of a treatise on the methods to be used in order to collect and preserve the seeds, roots, and bulbs of North American species that were to be sent to the collections of the royal gardens in France.[1] In 1790, Lord Dorchester, who was then Governor, imported fruit trees, including a variety of plum (green-gage), for the members of the Agricultural Society. The horticulturalist Auguste Dupuis believed that the so-called "Montmorency" plums, which were widespread at the beginning of the 20th century east of Québec City, were obtained from seeds of that same variety.[2] Other fruit trees, vegetables, and ornamental plants were undoubtedly used in acclimatization experiments in the gardens and greenhouse of the Château. Later, at the beginning of the 19th century, Lord Dalhousie and his wife corresponded with American and European botanists, including William Jackson Hooker. Between 1829 and 1840, Hooker published a Flora of British North America that included some species described on the basis of specimens collected in and around Québec City by Countess Dalhousie.[3]



7.1 Remains of the latrines excavated in the summer of 1986. (Canadian Parks Service, photo: Michel Élie; 38G86R127X-6)

THE LATRINES IN THE SOUTHEAST COURTYARD OF THE CHÂTEAU SAINT-LOUIS

The latrines excavated under the Dufferin Terrace in the summer of 1985 were located in the southeast courtyard of the Château Saint-Louis, along the cliff, between the laundry to the north, and the ash house to the south. The pit of the privy was lined with solid masonry. It was built in 1815, which was also the date of construction of the kitchen and laundry added to the Château. These outbuildings were demolished in 1854, in order to extend the Durham Terrace. We do not know how many people used these latrines and who they were, but we assume that the privy was frequented by the staff, or by the family of the gardener, who occupied the apartment added to the Château's kitchen after the 1834 fire.

PUTTING THE WITNESSES UNDER A MICROSCOPE

Collecting macro-remains in the field represents a very important stage in any archaeobotanical study. Because of their small size and great abundance, it is generally not possible to collect all the macro-remains. In the case of the Terrace latrines, which contained over ten cubic metres of sediments, the archaeologists carried out a stratified sampling.* The total volume of samples obtained corresponds to about 50% of the contents of the privy, ensuring a good representation of the site as a whole.

Some of the plant macro-remains were recovered by flotation. This technique, which makes it possible to separate organic from mineral matter, is based on the difference in the density of particles. It requires running water that circulates in a column where the raw material is placed by small quantities at a time. Organic matter in suspension floats in the upper part of the apparatus. In this way, small shells, insects, bones, seeds, and fragments of fruits and leaves can be collected in a fine sieve, or using a series of gradually finer sieves. However, most of the raw soil was directly sieved under a spray of water whose pressure and flow rate were carefully controlled, making it possible to recover plant and animal debris within a reasonable amount of time. The organic matter collected was then dried, roughly sorted, packaged, and labelled.

Plant remains were identified in the laboratory, requiring many hours of work under a stereoscopic microscope. Seeds have physical characteristics that make their identification possible generally at the level of the species, and sometimes even to the variety. The shape, size, colour, texture, and surface patterning of seeds are stable characters in most species.

Plant remains were identified using seed identification guides, illustrated floras, and reference collections. Available identification guides have been mainly designed for plants that are harmful to agriculture, or for plants occurring in certain natural habitats. The best way to identify fossil seeds is to compare them with herbarium collections. However, ethnobotanists would be well advised to build up their own reference collection, suitable for their needs, including seeds of food, medicinal, industrial, and ornamental plants. The necessary reference material can be found in the field, on the study site itself and in the neighbouring areas, as well as in markets selling fruits and vegetables that have been imported or locally grown.

Once classified and identified, the plant remains of each species are counted. At this stage, random sampling* makes it possible to save time in estimating the number of seeds of the most abundant species.

RESULTS

The samples obtained from the latrines contained 522,975 plant macro-remains belonging to some 60 species, of which half were edible plants. The fruits that left the most abundant remains include raspberries (87.3%), figs (6.3%), strawberries (4%), grapes (0.8%), and bird-cherries (0.7%). Currants, chokecherries, plums, and all other species together accounted for less than 1% of the plant remains. Compared with edible wild fruits, cultivated plants were represented by relatively few remains. Many non-edible species were found, but they accounted for a negligible proportion of the remains, i.e. 0.14% of seeds recovered.

A quantitative analysis showed that the assemblages varied very little between levels in the latrines: the most abundant species were represented in the same proportions. On the whole, the contents of the privy appeared to be rather homogeneous.

7.2 View of the Dufferin Terrace and the flotation apparatus. (Canadian Parks Service, photo: Michel Élie; 38G82R17X-3)

EDIBLE PLANTS		NON-EDIBLE PLANTS	
WILD FRUITS			
raspberry (*Rubus idaeus* L.)	456,704	mustard (*Brassica* sp.)	258
strawberry (*Fragaria* sp.)	20,830	purslane (*Portulaca oleracea* L.)	191
bird-cherry (*Prunus pensylvanica* L.f.)	3,713	lamb's quarters (*Chenopodium album* L.)	189
choke-cherry (*Prunus virginiana* L.)	629	hemp[1] (*Cannabis sativa* L.)	37
spikenard (*Aralia racemosa* L.)	117	wartweed (*Euphorbia helioscopia* L.)	12
hawthorn (*Crataegus* sp.)	98	henbane[1] (*Hyoscyamus niger* L.)	10
elderberry (*Sambucus* sp.)	84	knotweed (*Polygonum aviculare* L.)	8
bunchberry (*Cornus canadensis* L.)	37	lady's thumb (*Polygonum persicaria* L.)	7
viburnum (*Viburnum* sp.)	28	bladder campion (*Silene cucubalus* Wibel)	5
Canada plum (*Prunus nigra* Ait.)	12	broad-leaved spurge (*Euphorbia platyphylla* L.)	3
blueberry (*Vaccinium angustifolium* Ait.)	1	old-witch grass (*Panicum capillare* L.)	3
		sheep sorrel (*Rumex acetosella* L.)	2
TOTAL	(92.2%) 482,253	pinkweed (*Polygonum pensylvanicum* L.)	1
		hemp-nettle (*Galeopsis tetrahit* L.)	1
IMPORTS		white clover (*Trifolium repens* L.)	1
Fruits		buttercup (*Ranunculus* sp.)	1
fig[1] (*Ficus carica* L.)	33,163	balsam fir (*Abies balsamea* (L.) Mill.)	2
shagbark-hickory (*Carya ovata* (Mill.) K. Koch)	13	Rosaceae	3
Condiments		Cyperaceae	1
pepper (*Piper nigrum* L.)	1	Solanaceae	1
		Leguminoseae	1
TOTAL	(6.3%) 33,177	unidentified (8 taxa)	19
LOCAL CROPS			
Greenhouse			
grape[2] (*Vitis vinifera* L.)	3,989		
peach[2] (*Prunus persica* (L.) Batch.)	2		
Orchard			
gooseberry or currant (*Ribes* sp.)	2,583		
Damson plum (*Prunus domestica* L.)	169		
apple (*Pyrus malus* L.)	16		
sour cherry (*Prunus cerasus* L.)	13		
Vegetable Garden			
cucumber (*Cucumis sativus* L.)	5		
pumpkin (*Cucurbita pepo* L.)	3		
summer savory (*Satureja vulgaris* (L.) Fritsch)	1		
Field			
barley or wheat (Gramineae)	8		
TOTAL	(1.3%) 6,789		
TOTAL	**(99.8%) 522,219**		**(0.14%) 756**
		GRAND TOTAL	**522, 975**

1 May have been locally grown.

2 May also represent imported fruit.

SEEDS ALSO HAVE A HISTORY

Biological data on plants found in latrines can be very useful for interpreting plant macro-remains. If one knows the distribution and habitat of the plants recovered, one can suggest the possible routes followed by their seeds, from the area of production to their final resting place. Between the mother plant and the privy, various transportation, transformation, and disposal agents played a role, and can be associated with various functions.

The transportation of fruits produced only in distant regions was probably the result of trading activities. The transformations undergone by fruits (seeding, maceration, cooking, preserving, partial digestion by gastric juices) were associated with activities such as the preparation and ingestion of food. The deposits themselves were derived from the disposal of food waste.

Sometimes, seeds reveal only some of their history. For example, how can we know whether the seeds of broad-leaved spurge came from plants that grew on the site, or whether they were obtained from elsewhere for a specific use? The seeds found in the Terrace latrines and other archaeological sites in the city represent the only evidence of the occurrence of that plant in the Québec City area, where it has never been recorded or collected.

It is not always possible to assign an exclusive function to plants that may have many uses. Almost all plants that produce edible fruit, and even some plants that are today considered as "undesirable," have medicinal properties. It is also necessary to take into account the fact that some potential uses may have been very occasional. Furthermore the differences between the seeds of cultivated plants and those of their wild relatives are not always clear. And, even if they were, wild plants could have been cultivated, and cultivated plants might have escaped into the wild.

On the other hand, the history of seeds can sometimes be read from their appearance alone. Some seeds found in the samples were clearly recent contamination: immature seeds of Compositae, dandelion achenes with their silks still intact, and elm tree seeds with their wings.

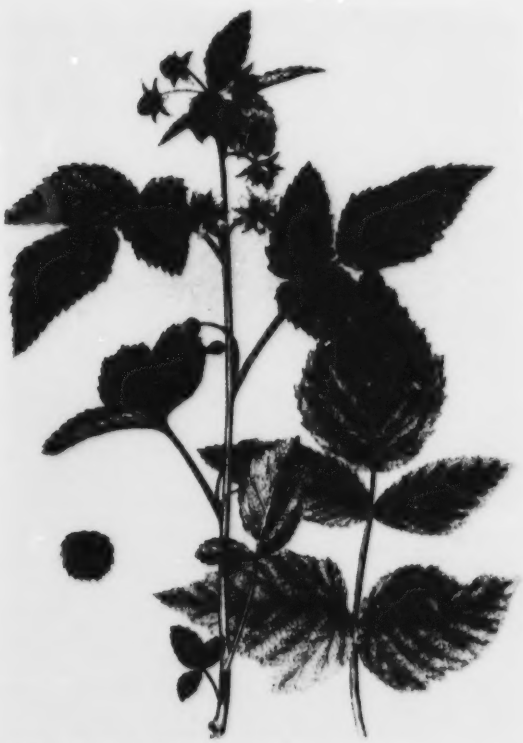
7.3 Fossil seeds recovered from the latrines: from top to bottom, on the left: grape (*Vitis* sp.), hemp (*Cannabis sativa* L.), raspberry (*Rubus idaeus* L.), bird-cherry (*Prunus pensylvanica* L.f.),; from top to bottom, on the right: bunchberry (*Cornus canadensis* L.), elderberry (*Sambucus canadensis* L.), hawthorn (*Crataegus* sp.), strawberry (*Fragaria* sp.).
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-65)

7.4 Fig seeds (*Ficus carica* L.). The dark seeds, on the left, are macro-fossils recovered from the latrines; the light seeds, on the right, are achenes from the reference collection (CF84-43).
(Canadian Parks Service, photo: Jean Jolin; 38G-106/ACM/PR-6/P-61)

WHAT THE MACRO-REMAINS CAN TELL US

Some plants may be associated with specific activities, such as food, sanitation, agriculture, harvesting, and trade. This is why the remains were classified according to whether they are edible or not, and whether they belong to plants imported from Europe or from elsewhere in America, to cultivated or wild species.

The consumption of food is undoubtedly the most widely represented activity in the contents of the privy: indeed, 99.8% of the plant remains consist of seeds of edible fruits. As far as sanitation is concerned, the double function of the latrines as privies and waste dumps is clearly demonstrated by the occurrence of both numerous macro-remains (98.2%) that were probably ingested (raspberries, figs, etc.), and larger seeds such as plum and cherry stones, hawthorn, grape and apple pips, pumpkin and cucumber seeds, charred seeds, and nut shells. These larger remains most likely came from leftovers and/or kitchen wastes, and testify to the preparation of meals.



7.5 Raspberry bush (*Rubus idaeus* L.)

(Illustration drawn from Flora Danica [1782], Vol. 5, Plate DCCLXXXVIII; collection of the library of the Botanical Garden of the City of Montréal)

Harvesting wild fruits was an important activity in the acquisition of food, but their occurrence in privies could also indicate commercial activities, since they were sold in local markets. Strawberries, raspberries, and other small fruits, such as bird-cherries, choke-cherries, hawthorn, and elderberries grew abundantly in the city of Québec, or its environs.

No ornamental plant remains could be unambiguously identified among the remnants of the latrines. However, the seeds of cultivated fruits and vegetables evidently bear witness to horticultural activities. All the cultivated fruits could have been produced in the orchard, the vegetable garden, or for figs in the greenhouses of the Château. Writing of the well-tended crops that his fellow citizens could admire around Québec City, J.M. LeMoine[4] praised the beautiful hot-houses where the most delectable grapes, succulent peaches, smooth-skinned nectarines, apricots, bananas, and figs ripened under glass. However, the cultivation of fig plants, which was undoubtedly a rare occupation reserved for the enjoyment of few, is not mentioned before 1862.[5] As far as grapes and peaches are concerned, they could have been imported from the Montréal region or grown under glass. Since shagbark hickories do not grow in the Québec City area, their nuts could have come from regions located more to the west and would then bear witness to regional trade. Only pepper, a spice that had to be imported, and probably figs, which are a product of the Mediterranean regions, would thus be evidence of intercontinental trade.

The presence of non-edible plant remains can be explained by the occasional accidental intrusions due to visits by users or the emptying of the privy. Mustard, purslane and lamb's quarters are the most abundant ones. Weed seeds found in the deepest layer may have fallen there when the pit was dug, or may have already been present in the soil in situ, when the first waste was deposited.

Other non-edible plants that cannot be properly described as "weeds," because they do not become easily naturalized, could well have been cultivated. These include henbane, which was used in the past as a popular cure against pain, in spite of its toxicity; and hemp, which was exploited for its fibres. Since they are capable of surviving without care and can propagate spontaneously (they are then said to have "escaped from cultivation"), it is only indirectly that they are associated with human activities.

EATING HABITS AND LIVING CONDITIONS

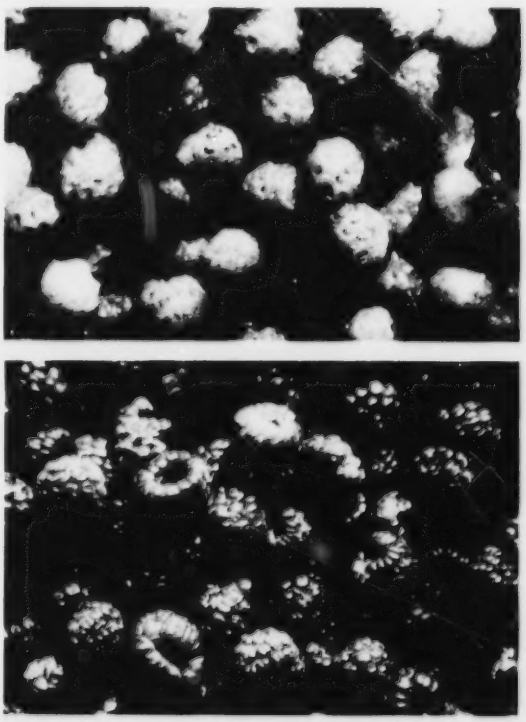
It is impossible to obtain a complete picture of the plant diet on the basis of the only remains that were disposed of or defecated. This would be like trying to reconstruct the composition of the meals we ate last week from the contents of Monday's garbage can. There are foods that leave no waste, and there are others whose remains decompose quickly. Thus, the plant remnants found in the latrines are almost exclusively seeds. Nevertheless, they do permit an analysis of some food preferences.

The nature of the plants found reflects the food choices of the users of the Terrace latrines. The assemblage of edible fruits shows some similarity with those that are eaten today. Raspberries, strawberries, peaches, grapes, plums, apples, and cherries still find a place on our tables, and have formed part of fruits imported, cultivated, or gathered by the inhabitants of Québec City since the very beginning of the colony. We also found seeds of wild fruits that are not very fleshy, have large seeds or hard stones, and are only very rarely eaten today; these include bird-cherries, choke-cherries, hawthorn, elderberries, bunchberries, viburnum and spikenard. In 1813, the traveller Lambert wrote that a tasty liqueur could be prepared from the fruits of wild cherries (including bird-cherries and choke-cherries), and that the latter were practically used for no other purpose.[6] Before the introduction of fizzy beverages, fruit syrups were used as the basic materials to make refreshing drinks. Thus, the berries that we scorn today offered then a good way to take advantage of their medicinal properties or high vitamin C contents. They were used, alone or in addition to others, for making syrups, jellies, vinegars, or wines. Such preparations, apart from getting rid easily of large seeds, made it possible to enjoy the benefits of fruits that are good-tasting, and have an attractive colour and a slightly bitter taste.

Gooseberies and red currants left many remains in the Terrace latrines, although they are rather rare in contemporary privies of Québec City. The remains of these two related species were much deteriorated, probably due to bacterial activity, so that it was not possible to separate currant (*Ribes sativum* Syme) from gooseberry (*Ribes grossularia* L.) seeds. The historian Jean Provencher estimates that varieties of currants cultivated in the 19th century in Québec and elsewhere were the results of crosses carried out by English horticulturalists.[7] According to Léon Provancher (1862), their fruits were used as condiments to season meats and fish, and were also eaten in desserts and preserves. He added that currant bushes were grown in every garden, and that their acid, pleasant-tasting fruits were used to make jellies, syrups, and a wine that was not without some merit.[8] Already at the time of the French regime, red currants were abundantly planted in every garden.[9]

Plant macro-remains can also provide some indication of socio-economic level[10]. A high social status provides better access to rare and exotic foods, such as imported fruits, and makes it possible to buy the so-called "luxury" items, in addition to basic foodstuffs. The analysis showed that the users of the Terrace latrines made abundant use of the food resources from their natural environment, which provided them with a wide variety of wild fruits. But they also consumed some fruits, either imported or greenhouse-grown, that could only be obtained if one had a comfortable income.

Fruits must be part of any well-balanced menu, for their nutritional value as well as for their attractiveness and their taste. Other benefits, associated with their laxative, diuretic, or mineralizing activity are also attributed to them. The macro-remains show that the users of the latrines consumed a wide variety of fruits, which undoubtedly contributed to balance their diet.



7.6 At the top: wild strawberries (*Fragaria virginiana* Duchesne); at the bottom: raspberries (*Rubus idaeus* L.).
(Photo: Pierre Morisset)

A PROMISING APPROACH

The study of the macro-remains recovered from the latrines in the southeast courtyard of the Château Saint-Louis illustrates clearly the contribution that the natural sciences, particularly paleobotany, can make to archaeology. This approach led to the identification of a large variety of fruits, both indigenous and imported, that were eaten or used. It also provided insights into the many activities that gave rise to these assemblages of macro-remains. The history of the relationships between human communities or groups and their natural environment should involve systematic studies of plant remains from archaeological sites.

C. F. ■

GLOSSARY

ADVENTITIOUS PLANTS: plants that have been introduced in a country or region in an unintentional way. Often, their seeds contaminate those of fodder or cultivated plants. Weeds are almost all adventitious. Examples: lamb's quarters, mustard, purslane.

ALLOGENOUS PLANTS: plants that originated in Europe, Asia, or elsewhere in America, as opposed to indigenous plants.

INDIGENOUS FLORA: the group of plants that grow spontaneously in a given area, before human intervention.

INTRODUCED PLANTS: plants that were intentionally imported in the historical period, and adventitious plants. Several introduced plants have become naturalized i.e., they have become so well adapted to the climatic conditions of the country that they now form an integral part of its flora.

RANDOM SAMPLING: a sampling process where each element has an equal chance of being sampled.

SEED: general term used to describe the plant organ capable of producing a new individual. Seeds are divided into three categories: seeds properly speaking, i.e., the organs produced by the transformation of the ovules (for example, cucumber, pumpkin); achenes, i.e., dry fruits containing a single seed wrapped in its tegument (for example, fig, strawberry); and caryopses, which are similar to achenes, except that the seed adheres to the wall of the fruit, and the tegument of the seed has disappeared (for example, barley, wheat).

STRATIFIED SAMPLING: a sampling process where the unit to be studied is divided into subsets, and each subset is sampled separately; in this case, the latrines were divided into stratigraphic layers, each of which was then sampled at random.

TAXON (plural TAXA): a general term designating any group of objects that is classified.

NOTES AND REFERENCES • Chapter 7

1. *Voyage de Pehr Kalm au Canada en 1749* (Montréal, Pierre Tisseyre,1977, annotated translation of the travel journal by J. Rousseau and G. Béthune with the co-operation of Pierre Morisset), folio 830.

2. A. Dupuis, "Origine des pruniers européens du Canada," *Journal d'Agriculture et d'Horticulture*, nº 9 (1905-1906), p. 369.

3. Sir W.J. Hooker, *Flora boreali-americana; or the botany of the northern parts of British America...* (London, H.G. Bohn, 1840), 2 volumes.

4. J.M. LeMoine, *Monographies et Esquisses* (Québec, J.G. Gingras, 1884), p. 341.

5. L. Provancher, *Flore canadienne* (Québec, J. Darveau, 1862), p. 524.

6. J. Lambert, *Travels Through Canada and the United States of North America, in the Years 1806, 1807 & 1808* (London, C. Cradock and W. Joy, 1813, 2nd corrected and improved edition), p. 93.

7. J. Provencher, *C'était l'été: La vie rurale traditionnelle dans la vallée du Saint-Laurent* (Montréal, Boréal Express, 1982), p. 137.

8. L. Provancher, *op. cit.*, p. 248-249.

9. P. Kalm, *op. cit.*, folio 786.

10. E.J. Reitz and M. Scarry, "Reconstructing Historic Subsistence with an Example from Sixteenth-Century Spanish Florida," ed. D.J. Seifert, Society for Historical Archaeology, Special Publication Series, No. 3 (1985).

Conclusion

Pierre Beaudet

The archaeological remains of the southeast courtyard of the Château Saint-Louis are again protected from the vagaries of man and nature under a thick mantle of canvas and sand. Research carried out in the archives buried under the Dufferin Terrace has produced results that enrich our understanding of the site — its development and use — as well as of some aspects of material culture that are rarely studied.

The excavations carried out from 1985 to 1987 revealed ruins of military structures from the 17th and 18th centuries, as well as the remains of several outbuildings "essential" to life at the Château. The greenhouses, icehouse, latrines, ash house, and sheds, plus thousands of artifacts and food remains, have provided abundant information on aspects of horticulture, the conservation of ice and perishable foods, and on the daily life of the occupants of the site, from the end of the 18th century to the 1850s.

The purpose of each chapter in this book was to shed light on a particularly interesting aspect of the discoveries and, in some cases, to place them in a wider thematic or technical framework. In this way, the archaeological remains have taken on new life, and can now be placed in relation to the natural or cultural contexts which lay beyond the walls of the southeast courtyard of the Château Saint-Louis.

Even though research was focused on particular aspects of the history of the site, it has approached wider questions and enriched our grasp of subjects such as changes in the defence of the town, the adaptation of horticultural practices to meet different environmental conditions, the circulation of domestic goods, eating habits, and the effects of fashion.

The archaeological studies carried out under the Dufferin Terrace have not yet been completed. Investigations in the Château itself, as well as in the neighbouring courtyards, and Upper Garden, will add to our understanding of life in and around the Governor's mansion, and the evolution of this section of the town.

Finally, we could not end this archaeological exploration under the Terrace without a look back at the famous boardwalk that for more than one hundred years, has not only protected the remains buried under it, but provided a most splendid view of city and river.

ILLUSTRATED RETROSPECTIVE

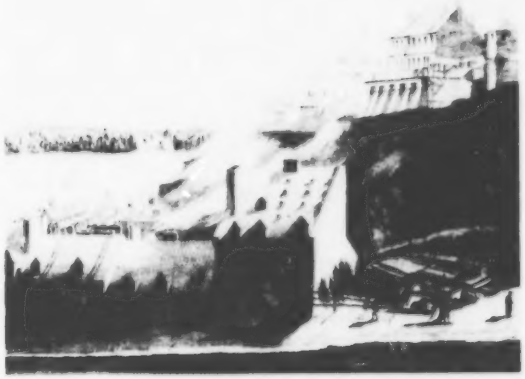
The History of the Terrace

Geneviève Duguay

Before it became the long promenade and popular gathering place that we have known since the end of the last century, a place that neither outrageous projects, nor disasters, nor various refurbishings have been able to change, the Terrace was first a modest belvedere, and then a pleasant and more roomy boardwalk built above the ruins of the Château Saint-Louis. Let us look at a few pictures that illustrate the highlights that have marked its history.

The Château Saint-Louis

1



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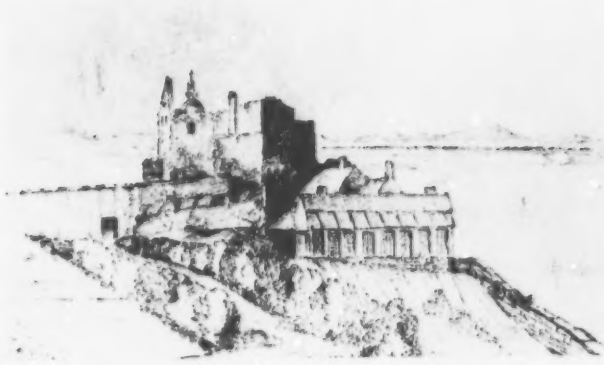
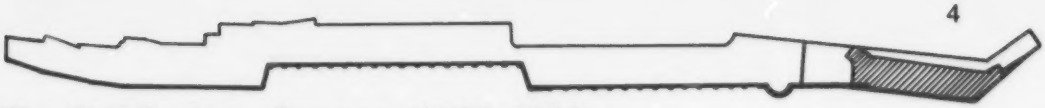


3

Destruction of the Castle of St. Lewis by Fire

This building, the residence of the Governors General of B. N. America for the last 150 years, and so prominent an object in the view of the city of Quebec from the harbour, as it surmounts the brink of the precipice between the Lower Town and the citadel, has fallen an entire prey to the flames. The fire broke out yesterday about noon, in a room at the south end of the building, in the third story, occupied by Capt. McKinnon, A.D.C.; and though early discovered and every means taken to arrest its progress, it flew with astonishing rapidity through the upper story, and continued to burn downwards, in spite of all the exertions of the troops and about a dozen fire engines, until this moment. It now presents its hundred openings, tall bare chimneys, and its sooty and ruined walls — a couple of engines still struggling to subdue the flames in the south wing.

Gazette (Québec), 24 January 1834



4

The First Durham Terrace (1838-1854)

In 1838, the Governor, Lord Durham, gave orders to pull down the ruins of the Château Saint-Louis to its foundations. The levelled ground then became the chosen site for the construction of a picturesque promenade or platform. Until that time, only the Governor could enjoy the view, from the private terrace of the Château; but, from now on, the platform would be open to all.

Initially built without planking, the promenade was bordered with a wooden balustrade. Subsequently, the surface was covered with planks and a metal railing was installed.

"We are authorized to state, that His Excellency the Governor General has directed the platform on the site of the Castle of St. Lewis be thrown open to the public, the railing in front of the platform being now complete."

Gazette (Québec), Saturday, 28 September 1838

5

During the construction of the platform, in 1838, the outbuildings of the Château Saint-Louis still formed an important part of the landscape and were still in use.

6

"Durham Terrace, with its approaches, has been for some days past cleared of ice and snow, and in consequence has become the favorite resort of promenaders through all hours of the day. The fine band of the 54th regiment enlivened the scene by its sweet music yesterday afternoon, when the prospect looking towards the calm river, covered with sail boats, was charming to look at, and would have reminded us of summer but for the snow clad fields and hills in the distance around."

Quebec Mercury, Saturday, 2 April 1853

7

8

The Second Durham Terrace (1854-1878)

The popularity of the first terrace quickly led to its restoration and extension.

9

The Château Haldimand, which was built in 1784 to replace the Château Saint-Louis, was first used as the Governor's residence. Subsequently, it was used to house government offices and later still, by the municipal corporation, to accommodate various persons and associations. Finally, the building sheltered the École Normale, from 1865 until its demolition in 1892.

Towering above the Côte de la Montagne, the Durham Terrace occupies a small area at the top of the promontory, at the end of outmoded defensive works, and near formerly prestigious gardens.

10

11

"The view from the Platform is incomparable. The spectacle is so beautiful that I would render it discreet homage just by not describing it, after so many others who have unsuccessfully attempted to portray it adequately. In the morning, on a clear day, one would imagine being in Naples before the arrival of Garibaldi. Whoever you are, a nature lover or business clerk, you will never stop contemplating this vast horizon, and breathing this superb air; not only will you feel better after your exercise, but you will even feel the sweet and powerful effect of nature upon the heart and spirit; you will give your imagination wings, and will feel your emotions expanding, and a golden ray will touch your figures so that little by little you will abandon yourself to poetry. However, promise me that you will go beyond the Alexandrine lines."

"In a summer evening, when the Platform is covered with idle strollers, and Lévis is sprinkled with lights, when the lights in the narrow streets and dormer windows of the Lower Town are lit, and the city comes alive under the lively rumours that make business go round, when we can glimpse on the water the great shadows of vessels in the port, the scene has a marvellous exuberance. It is specially at that time that one becomes aware of the similarities between Quebec and European cities; one would believe it to be a transplanted French or Italian town. The appearance is the same, and we must wait for the break of day to become aware of the changes brought about by the crossing to America. [...]"

Translated from James Macpherson LeMoine, *L'album du touriste*, 1872

"The Platform is the habitual meeting place of idle strollers. It is there that people go to awaken their appetite and digest their good dinners. At all hours of the day there is always someone, some indolent idler lying in the sun, or a thinker cooling his burning forehead. Meetings are held from morning to night: conversations continue from day to day, and tomorrow the interrupted conversation of the night before will go on. If you do not know the address of a lawyer, employee, physician, or journalist, with whom you need to deal, and are loath to search in the Directory, take this piece of advice: go to the Platform, because sooner or later he will be there."

12

"The lawyers, brief cases under their arms, and white ties flying in the wind, make there a short and imposing appearance before the opening of the court; doctors send their convalescing patients there with a guarantee of recovery, and husbands send their bored wives, with an equal guarantee; there also office workers forget to return to work, and journalists congratulate each other on their articles, make a common front to prepare the controversial discussions that will arouse the passions of their followers, reach fraternal agreements, or arm themselves against each other. [...]"

Translated from James Macpherson LeMoine, *L'album du touriste*, 1872

At the end of the Terrace, the Lower Garden and its pathways extend towards the Citadel. Built in 1857, the guard house that we can glimpse at the back is still standing under the present boardwalk. The houses on Carrières Street have undergone certain changes, but remain unperturbed admirers of the river.

15

The increasing affluence of Québec's residents and visitors led, in the 1870s, to a whole rash of proposals to extend the second Durham Terrace. Built on such a fabulous site, it would be at the heart of some extraordinary dreams, including the grandiose project started in 1878 by Lord Dufferin.

16

The Dufferin Terrace (from 1879 to the present)

The collaboration between the enlightened Governor, Lord Dufferin, and the architect Charles Baillairgé led to the building of the Dufferin Terrace. Lord Dufferin thought that, with its picturesque enceinte and imposing Citadel, Québec offered spectacular panoramas that would be impossible to find anywhere else from Cape Horn to the North Pole. The Terrace would give the finishing touch to this incomparable site.

17

"The mayor of Quebec will telegraph His Excellency the Governor-General today, to inform him that the City Council has awarded the contract for the construction of Dufferin Terrace, and will pay him the graceful compliment of inviting him to lay the corner stone of the work, and request him to name the hour on Friday for the ceremony. [...]"

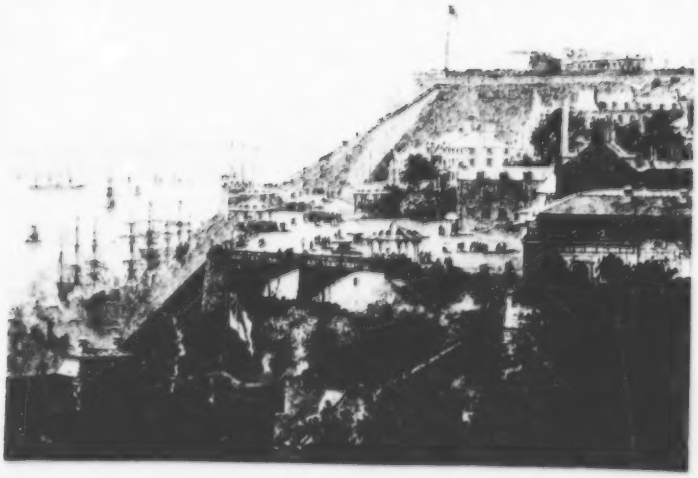
Morning Chronicle, 16 October 1878

The construction work started in the fall of 1878, the boardwalk was completed in 1879, and the front wall in 1884.

18

The Dufferin Terrace is a very long promenade built into the city's enceinte. Before the era of concrete and steel, the boardwalk was laid on a wooden framework supported by stone walls. The boardwalk is decorated with a cast iron railing and five kiosks to which a sixth would be added to shelter the brass band. From that time on, the Terrace would be at the centre of many events in the social and cultural life of Québec.

The Promenade



19

20

The Opening in Three Versions

Lord Dufferin laid the first stone a few days before definitively leaving the country.
The opening took place ten months later, in the presence of the new Governor General, the Marquis of Lorne and Princess Louise. A memorable day marked with solemnity!

21

22

On each of the five kiosks flies a flag that identifies them as Frontenac, Lorne, Victoria, Dufferin, and Plessis respectively. A sixth kiosk will be built later to accommodate the brass band.

23

"According to notice previously given the inauguration of Dufferin Terrace occurred at half-past two o'clock in the afternoon. When that hour arrived a mass of people, variously estimated at from eight to fifteen thousands, but probably containing about ten thousand, occupied the Terrace. The appearance from an elevated place of this sea of humanity was indeed wonderful. The band pavillion in the centre of the garden had been reserved for the Vice-regal party, and was covered in carpet and scarlet cloth, with two chairs of state. The entrance to the pavillion was kept by the City Police, while "B" Battery furnished the band and guard of honor, and played the National Anthem as the distinguished party arrived on the field."

Morning Chronicle, 18 June 1879

The Gatherings

This event, attended by the public in 1896 or thereabouts, has yet to be identified. It represents a good illustration of the atmosphere of yesteryear, in the era of bicycles, tramways, and horse-drawn carriages.

24

The inauguration of Champlain's Monument, 21 September 1898. Ten years later, on the occasion of Québec's tercentenary, this site was the focus of several official ceremonies.

26

This animated crowd watching the river is undoubtedly looking at some famous vessel, such as the *Indomitable*, which carried the Prince of Wales, who was the guest of honour at the tercentennial celebrations. They may also be watching the British war fleet that came to demonstrate contemporary progress in engineering. Photographers were present in the crowd with their large format cameras.

25

27

The Summit held in September 1944 captured public attention. The admiration with which Churchill and Roosevelt were held was frequently displayed on the pages of the daily newspapers. Sometimes, as in this example, this admiration is expressed through a shoe merchant's ad. It only includes his address at the bottom of the page, after a glorification of the four historical events that have marked Québec's history: the foundation, the Conquest, Confederation, and the Summit.

Winter Sports

28

Post card of the beginning of the century showing the famous slide, an attraction which appeared as early as 1884.

Since the beginning of the century, the town popularized winter sports in order to revive its tourist industry. Thus was born the Québec Carnival. The Dufferin Terrace was equipped with a slide and a skating rink, and also welcomed curling players and snowshoe races.

29

The skating rink, which was built directly on the Terrace between the bannister and a cannon battery, takes advantage of a unique site.

Summer Activities

The Dufferin Terrace is open to all and for all kinds of activities. It is a place where unusual things can be seen.

30

The neighbourhood children come to the Terrace for an exciting tricycle ride.

31

Adult bicycles provide an occasion for a demonstration of extraordinary prowess that catches the interest of a suitably impressed audience.

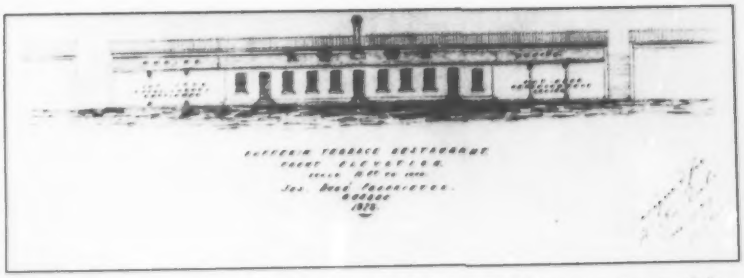
32

"The brass band of the Royal Artillery will play on the Terrace this evening, from 9 to 10, weather permitting."

Translated from *Le Soleil*, Tuesday, 7 July 1914

Some Unusual Projects

Both the top and the underside of the Terrace have inspired several projects, including some very unusual ones. Some of these have been met with strong disapproval on the part of the public, who have always tried to ensure that no changes are made that would affect the beauty of their beloved Terrace.

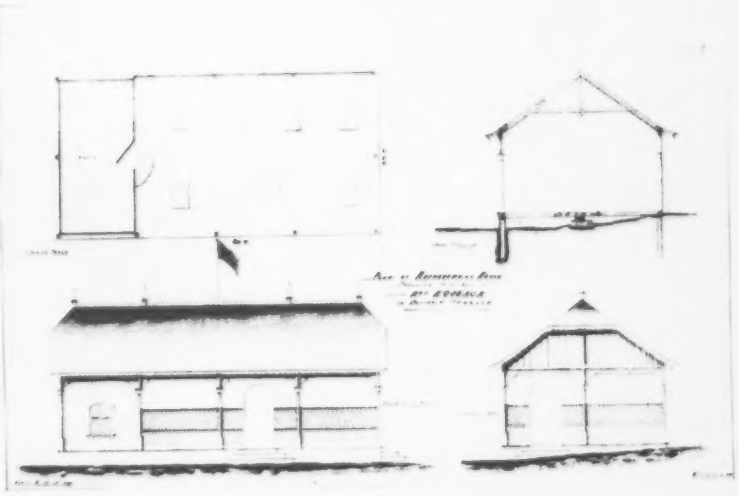


33

This project, proposed by Jos. Dubé in 1878, was stopped by popular pressure. The restaurant would have faced Carrières Street, in front of the Parc des Gouverneurs.

The Dreams of the Restauranteurs

The snack kiosk proposed in 1884 by the Widow Hossak was apparently never built. The plans were made by Henry Staveley.



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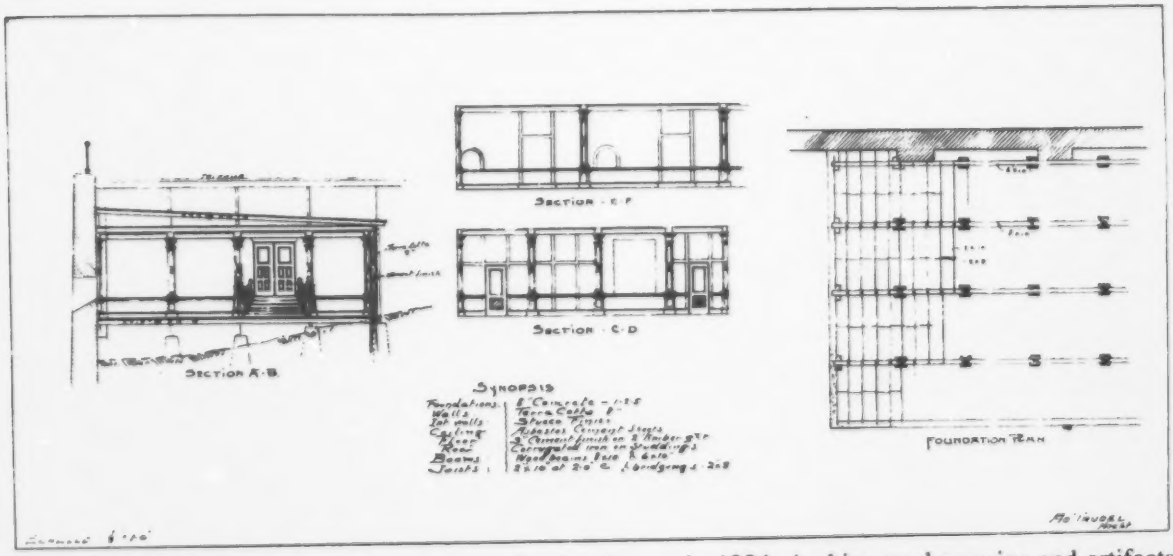
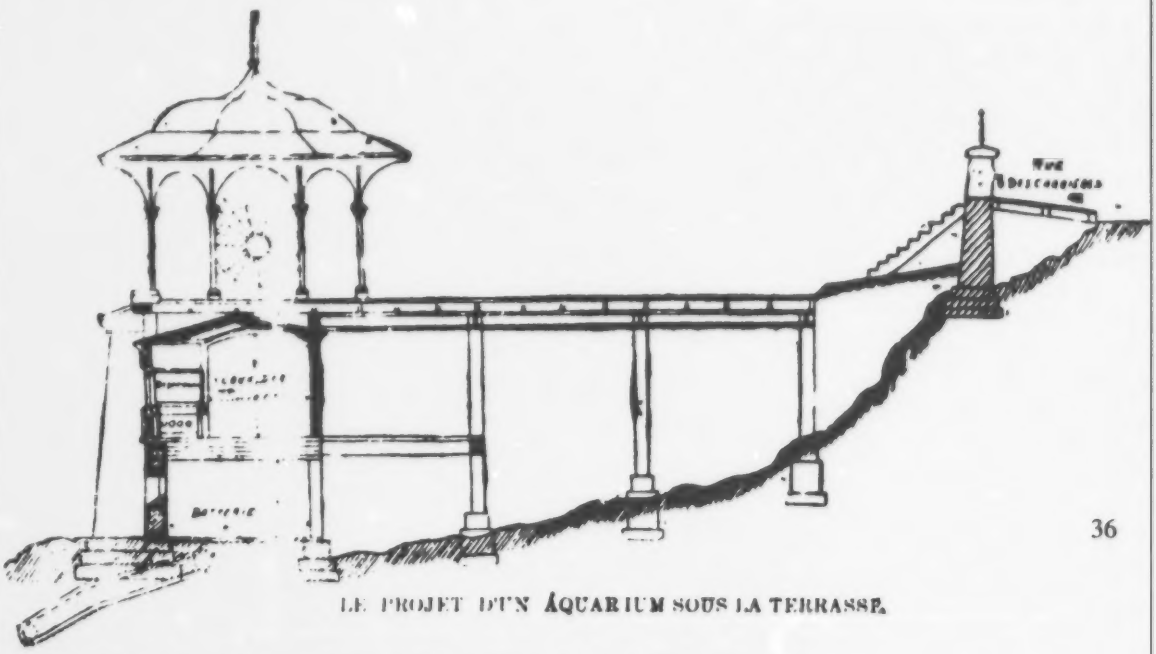


35

This restaurant seems to have been built under the Terrace in 1924. Architectural remains and artifacts found during the archaeological excavation are witness to it.



36

LE PROJET D'UN AQUARIUM SOUS LA TERRASSE.

Why Not Build an Aquarium Under the Terrace?

A Suggestion by Mr. Baillairgé

In the words of Mr. Baillairgé, the site is unique in all the world for the building of an aquarium, because it can be used to house marine, river, and lake aquatic and land fauna in the upper ten feet of the space under the promenade, and leave free the ten lower feet in order to be used, if need be, for the defense of the town, by taking advantage of the loopholes and embrasures built in the wall which, on the front of the Terrace, rises to 20 feet and separates the cliff from the boardwalk used by the strollers.

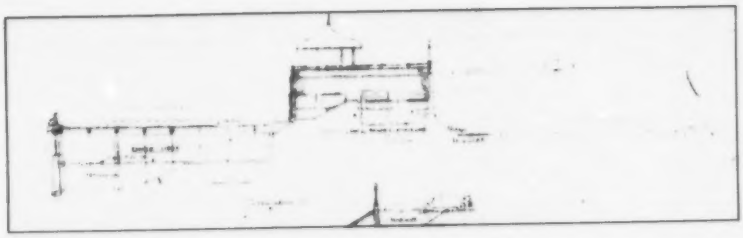
Mr. Baillairgé's sketch proposes a conservatory 15 feet wide, 10 feet high, and 700 feet long extending from the northeast to the southwest. The access would be through a spiral staircase located under the pavilion of the half-moon battery. The exit would be through a similar stairway built under pavilion number 4, to the southwest. The existing 33 free spaces and buttresses would be used for the fish tanks.

These facilities would consist of nothing more than cisterns or tanks built of thick glass which would be tightly sealed within a light steel framework attached to an iron base measuring one-quarter of an inch thick. The fact that the facility was far from the sea was of no concern since the composition of sea water was known and it could be made artificially. In order to control the temperature, the continuous corridor would be built with double facings, in order to protect it against the cold, and a double glazed front on the side of the St. Lawrence, as for a conservatory or hot-house. A few heaters would also be added.

Based on *Le Soleil*, 26 April 1900

Other Unusual Projects

A Parking Facility



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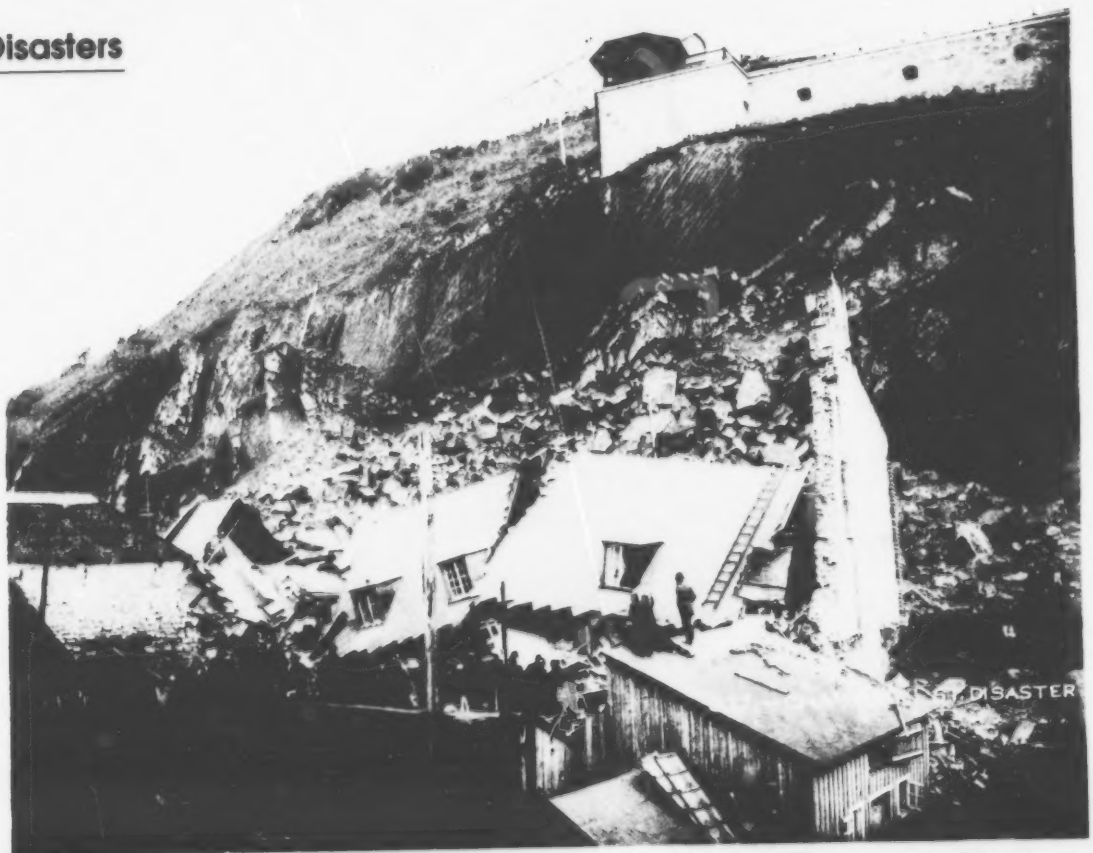
At the end of the 1940s, the advanced deterioration of the steel structure built under the Terrace in 1915 called for massive restoration. Édouard Hamel, Chief Engineer of the city, presented two reports, one of which contains a proposal for a parking garage under the boardwalk.
This 1948 project concerns a problem still acutely felt today. It is said that the parking garage, which could have accommodated 250 vehicles, would have served to lighten traffic in the area. Access would be from Carrières and Sainte-Anne streets, near the post office. A tunnel connecting it to the Château Frontenac would have completed this modern complex. Luckily, however, the very high building costs prevented the realization of this project.

The Disasters



38

The promontory has suffered several landslides, some of which have been dramatic. The Terrace itself lost part of its walls and planking. These events always tragically affected Petit-Champlain Street.

The landslide of 19 September 1889 destroyed seven houses and killed forty-five people.

39

The landslide of 17 May 1841 destroyed nine houses and killed thirty-nine people.

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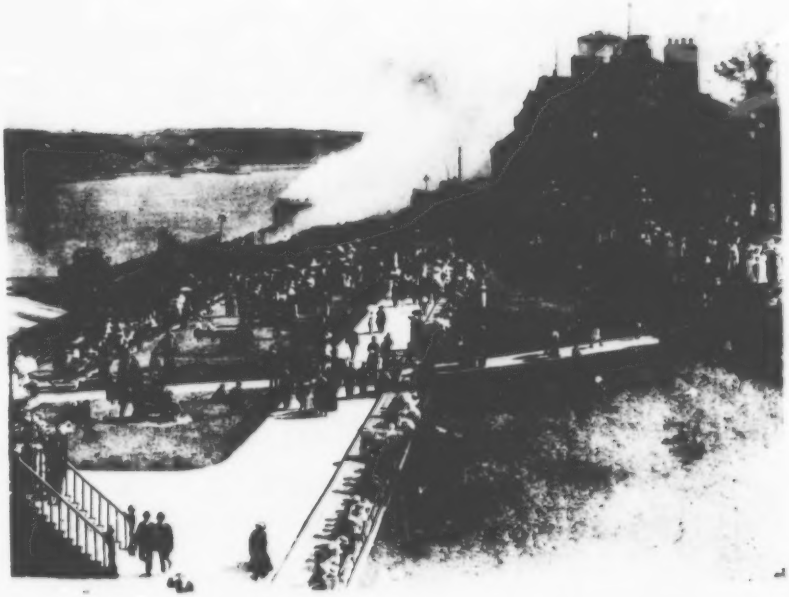
The day after the landslide of 1889, a crack or fissure opened in the rock. It has nourished popular imagination ever since.

"Thus, it was on Thursday, the 19th of September at 7:20 in the evening that the fatal moment arrived where the victims, even had they seen the landslide start, would not have had time to get out of its way. According to the report prepared by the City's engineer, Charles Baillairgé, the heavy rains during the last few days had caused some earth and stones, harbingers of the greater disaster to follow, to fall from the cliff. However, when the time came, it was a whole section of rock that lost its balance and fell as if a gigantic bread knife had been used to slice it. [...]"

Abbé Honorius Provost, *Notre-Dame-de-la-Garde de Québec 1877-1977*, Québec, La Société historique de Québec, 1977, Cahiers d'histoire no. 30, p. 238-240 (translation).

The Fire of 9 July 1914

This fire, which broke out near the Château Frontenac, spread to the southern section of the Terrace and destroyed one of the houses on Carrières Street. Heavily damaged to its foundations, the Terrace also lost one of its kiosks.



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Reconstruction included the installation of a steel and concrete infrastructure as was done in 1910 for the section affected by the 1889 landslide. However, wood will continue to play an important role in the Terrace, and this is true even today.

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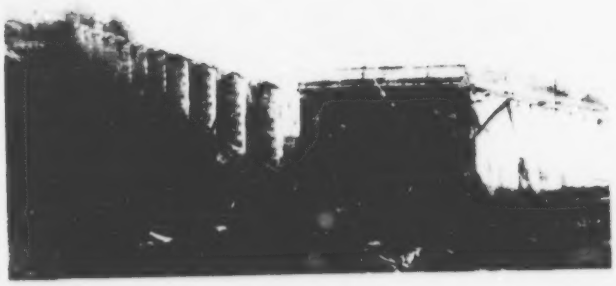

43

The wooden facing used to fill the spaces separating the buttresses was destroyed and was later replaced by concrete. The bannister and kiosk were faithfully reproduced.

Repair Upon Repair

The history of the terrace has produced a voluminous literature on its maintenance and successive refurbishings. Thousands of people have maintained, repaired, rejointed, or refurbished it, during its 150 years of existence.

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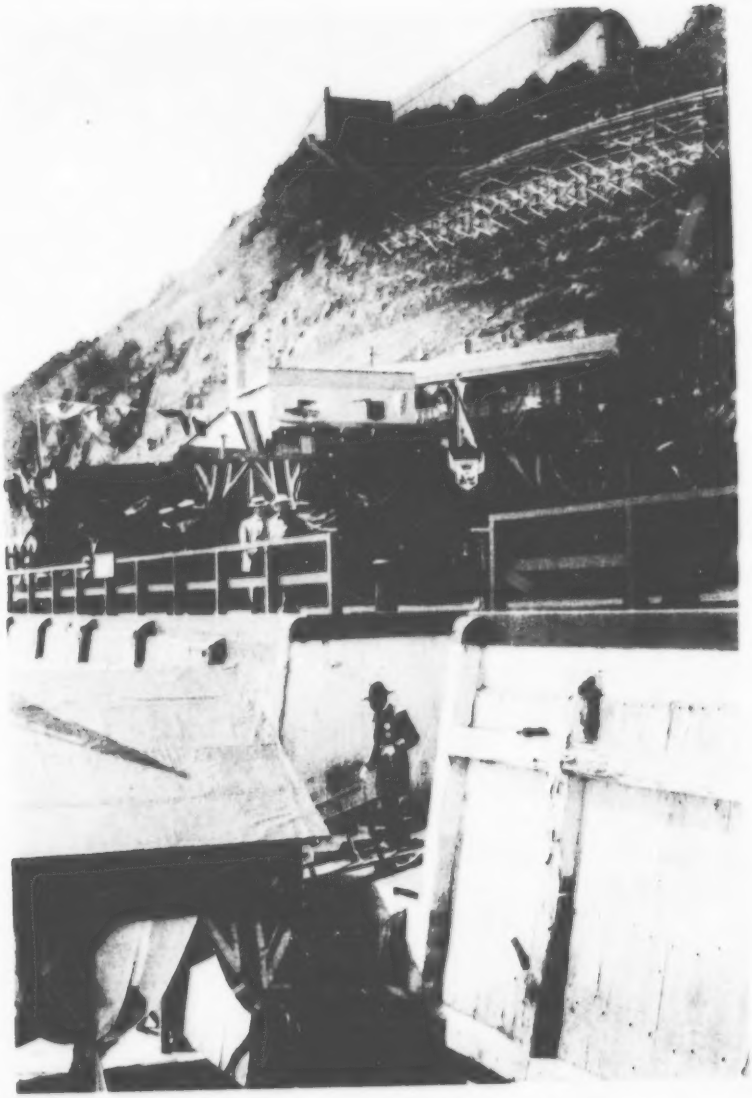
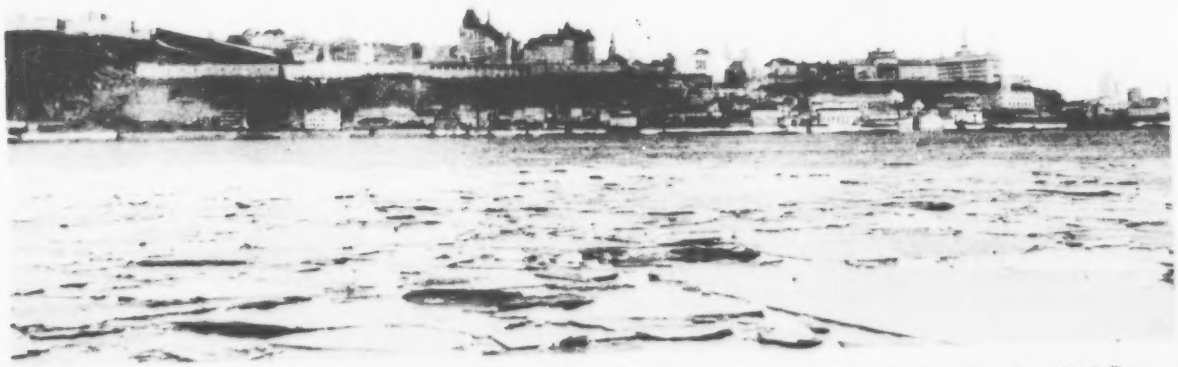
The rigours of the climate constantly undermine the structure thus requiring the constant upkeep of the infrastructure and planking. Sometimes, the supporting walls, weakened by time, have to be stabilized, and the occasional disaster may lead to a partial or total reconstruction.



In 1908, during the visit of the Prince of Wales, the future King George V, the reconstruction of the section damaged by the 1889 landslide was still not finished.

48



49

This view from the river shows the reconstruction of the northern section of the Terrace after the 1914 fire.

The Château Frontenac

In 1892, the École Normale (the old Château Haldimand) and the surrounding buildings were demolished, giving way to the modern and comfortable Château Frontenac hotel. The building is shown here in some of its various phases.

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The first version of the hotel during its construction from 1892 to 1897.

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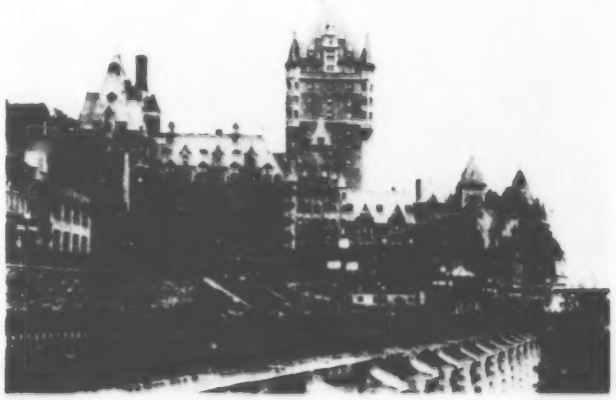
Postcard, circa 1900.



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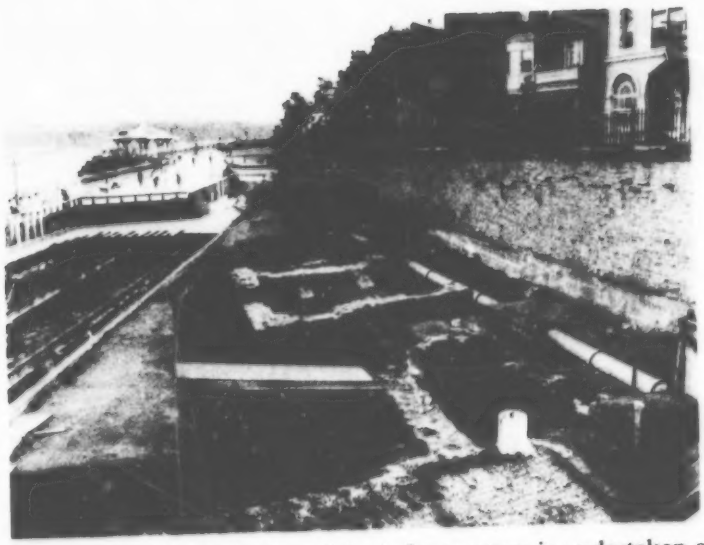
The present version, as photographed circa 1930.

Restoration and Archaeology



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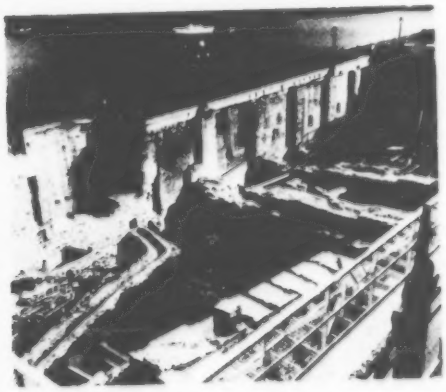
In 1981, the rehabilitation of the infrastructure is undertaken only after significant archaeological and historical research have been carried out. Our heritage is being rigorously protected.

Archaeologists, those chroniclers of the past, have excavated deep under the footings of the Terrace. This opportunity arose with the restoration of the infrastructure of the boardwalk.



56

Archaeological excavations were conducted both under the Terrace and in surrounding areas. Here, the past speaks of another time, when there were military fortifications, gardens, and outbuildings adjacent to the Governor's residence.

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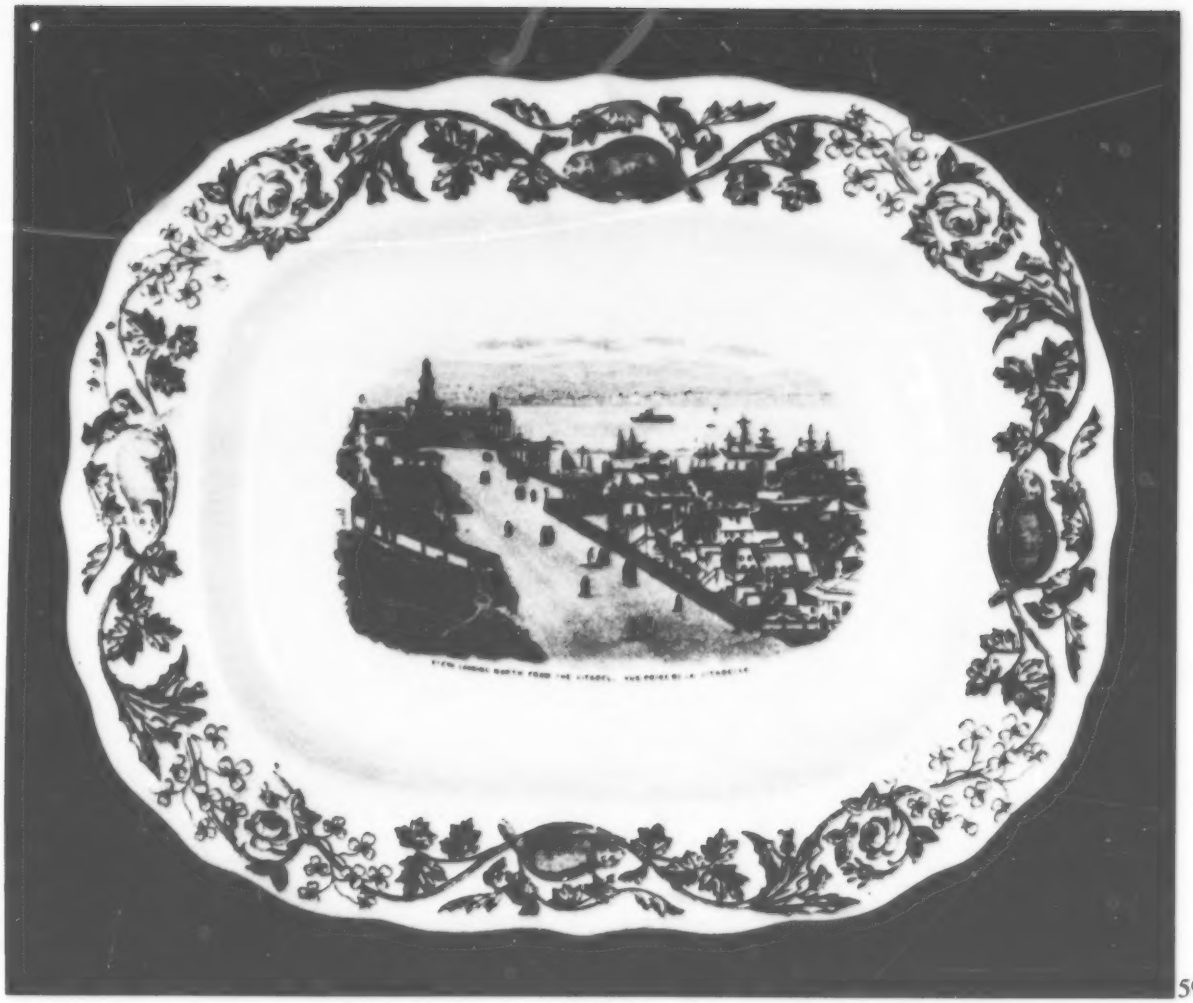
The stabilization work was done with the use of very modern techniques.



59

ILLUSTRATION SOURCES

Illustrated Retrospective: The History of the Terrace

1. "Quebec from the pont of 1830," James Patterson Cockburn; Royal Ontario Museum (hereafter ROM); 952.69.2, 69 CAN 182, detail.
2. Watercolour by J. Hunter, ca 1780; National Archives of Canada (hereafter NAC); C-1506, detail.
3. Archives nationales du Québec à Québec (hereafter ANQ-Q), Collection Initiale; GH 270-109.
4. Canadian Parks Service, drawing: François Pellerin.
5. ANQ-Q, Ballou's Pictorial Collection; N 275-102.
6. Drawing by W.H. Bartlett, engraved by E. Challis; Archives de la Ville de Québec (hereafter AVQ); A 091/E 4820 No. 10136.
7. "The platform – Quebec," G. Seton, 1848; ROM, 953.132.35, 68 CAN 133.
8. Canadian Parks Service, drawing: François Pellerin.
9. Copy held by the Canadian Parks Service in Québec; 104/00/IC/193, detail.
10. E. & H.T. Anthony & Co., 591 Broadway, New York, ca. 1870-1880; NAC, C-47011, detail.

11. Québec – View Taken from the belfry of Notre-Dame, photo: Jules Benoît, also known as Livernois; Fonds photographique du ministère des Affaires culturelles (MACQ); FM 14332 - AA - 8.

12. NAC, Ricketts Collection, Howard Ltd., 1979-1989; PA-112141.

13. Photo: L.-Prudent Vallée, circa 1875; Fonds photographique du MACQ; FM 14339-BB-6.

14. W.B. Edwards Inc., 819 rue Saint-Jean, Québec; copy no. 270.

15. ANQ-Q, Fonds Ayre, Michael; N 81-9-6.

16. Canadian Parks Service, drawing: François Pellerin.

17. Sketch of the Dufferin Terrace by the architect Charles Baillairgé, circa 1872; Archives du Séminaire de Québec, Photographie, photo: Michel Élie; Ph. 85.459.

18. NAC, A. Elliot Collection, 1962-035; C-28808.

19. G.M. Grant, ed., *Picturesque Canada* (Toronto, Belden Bros., 1882), vol. 1, p. 40.

20. *Ibid.*, p. 45.

21. AVQ, Centre de documentation photographique; A 091/H 5616 no. 4886.

22. NAC, C-72200.

23. NAC, Victoria Collection; PA-118201.

24. AVQ, Centre de documentation photographique – Livernois; A 091/H 5616 no. 7125.

25. NAC, PA-23977.

26. Photo: Keystone View Co; NAC, C-9508.

27. *Le Soleil* (Québec), 12 September 1944, p. 7.

28. Notman Photographic Archives, McCord Museum, McGill University; MP-1687.

29. Skating – winter sports, circa 1940; CP Rail Corporate Archives; M 2906.

30. ANQ-Q, Collection Initiale; GH 1071-9.

31. Fonds photographique du MACQ; FM 14421-GGG-5.

32. NAC, PA-61145.

33. AVQ, Charles Baillairgé Collection; A-352.11 - 1878, neg. FC-2075.

34. ANQ-Q, Staveley Collection; NC-81-2-19.

35. NAC, C-115314.

36. *Le Soleil* (Québec), 26 April 1900.

37. NAC, RG24, C1, vol. 6343, file 71-4-7; C-15623.

38. NAC, PA-23895.

39. Cap-Diamant Landslide, Joseph Légaré, circa 1841; musée du Séminaire de Québec, photo: Pierre Soulard; PC 983.30 R243.

40. ANQ-Q, Collection Initiale; N 81-3-18.

41. ANQ-Q, Collection Initiale; N 88-019.

42. AVQ, Centre de documentation photographique – Livernois; A 091/H 5616 no. 352.

43. AVQ, Centre de documentation photographique – Livernois; A 091/H 5616 no. 857.

44. NAC, PA-23925.

45. ANQ-Q, J.E. Livernois collection; N 81-3-21.

46. ANQ-Q, J.E. Livernois collection; N 81-3-19.

47. NAC, PA-23832.

48. NAC, PA-20836.

49. NAC, PA-61421.

50. ANQ-Q, Collection Initiale; N 78-4-40-16.

51. NAC, PA-24051.

52. Notman Photographic Archives, McCord Museum, McGill University; 2596A VIEW.

53. NAC, C-114816.

54. NAC, PA-44344.

55. Canadian Parks Service, photo: Michel Élie; 38G81R74X-9.

56. Canadian Parks Service, photo: Michel Élie; 38G86R127X-10.

57. Canadian Parks Service, photo: Michel Élie; 38G86R92X-12.

58. Canadian Parks Service, photo: Michel Élie; 38G85R85X-12

59. Canadian Parks Service, photo: Jean Jolin; EP-101/COH/PR-6/P-3

BIBLIOGRAPHY

Archives de la Ville de Québec.

Conseil et Comités, dossier château Saint-Louis.

Conseil et Comités, dossiers parcs, Agreement between Richard Clancy and the Corporation of Québec, 2 April 1845.

Série travaux publics, dossiers administratifs, soumissions, 24 March 1845.

Archives du monastère de l'Hôtel-Dieu de Québec (AMHD-Q).

Livre de dénombrement des terrains appartenant à la communauté de l'Hôtel-Dieu de Québec, 1739 (1790 copy), TR-3.

"Plan tiré par Mr Noël Levasseur Arpenteur, en 1748 du terrein des Religieuses de l'Hôtel-Dieu," PR 4-00020-002.

Notes et mémoires des anciennes mères, Ar. 5, No. 1, 1716-1774.

Journal General de la Dépence de Lhotel Dieu de Quebec. Commancé ce premier Juillet 1746, 1746-1781.

Registre Contenant L'Etat Des Biens, La Recepte, et la Dépence de L'hotel Dieu de Quebec fondé en 1639, par Md La Duchesse D'aiguillon pour L'edification et le secour des Sauvages, Et le soulagament des Miserables de la Colonie. Commancé le premier Janvier 1732, 1732-1775.

[Hôpital. Recettes et dépenses], 1776-1825.

[Hôpital. Recettes et dépenses], 1825-1859.

[Monastère. Recettes et dépenses], 1825-1856.

Archives du Séminaire de Québec.

Drawer 213, No. 4, "Plan of Fort St. Louis at Quebec, commonly called the Chatteau," by Henry Marr, 1779.

National Archives of Canada.

MG23, RG11, 17, Series 1, Vol. 21, p. 322, 24 May 1797.

MG24, A, 57, Mic. A-888, Sir John Coape Sherbrooke, 1808-1830.

RG1, E15A,
Vol. 11-35, 1771-1786.
Vol. 269.

RG11, Vol. 4.
Vol. 22, f. 25160.
Vol. 83, 14 November 1844.

Archives nationales du Québec à Québec.

Register of the Notre-Dame parish of Québec.

Register of the St. Patrick parish.

ARMINJON, Catherine and Nicole BLONDEL. *Objets civils domestiques: vocabulaire*, Paris, Imprimerie nationale, 1984.

AYLMER, L. A. "Recollections of Canada," *Rapport de l'archiviste de la province de Québec* (hereafter RAPQ) pour 1934-1935, Québec, Rédempti Paradis, 1935, p. 279-318.

BAILLARGEON, G. *Zonation et modification de la composition de la flore vasculaire dans une région urbaine: la colline de Québec*, Master's thesis, Université Laval, Québec, 1981.

BARNES, Leslie W. C. *Canada's Guns — An Illustrated History of Artillery*, Ottawa, National Museums of Canada, 1979.

BÉLIDOR, Bernard Forest de. *La Science des Ingénieurs dans la Conduite des travaux de fortification et d'architecture civile*, Paris, Claude Jombert, 1729.

BERGERON, Yves. *L'exploitation de la glace naturelle au Québec*, Master's thesis, Université Laval, Québec, 1984.

BERNIER, André. *Le Vieux-Sillery*, Québec, ministère des Affaires culturelles, 1977 (Les cahiers du patrimoine, No. 7).

BICKERTON, L. M. *An Illustrated Guide to Eighteenth-Century English Drinking Glasses*, London, Barrie & Jenkins, 1971.

BLONDEL, Jacques François. *Cours d'architecture, ou traité de la décoration, distribution et construction des bâtiments: contenant les leçons données en 1750 et les années suivantes dans son école des arts*, Paris, Desaint, 1771-1777, 6 vol.

BOUCHETTE, Joseph. *A Topographical Description of the Province of Lower Canada With Remarks Upon Upper Canada and on the Relative Connexion of Both Provinces with The United States of America*, London, W. Faden, 1815.

BRAUDEL, Fernand. *La Méditerranée et le monde méditerranéen à l'époque de Philippe II*, 6th. ed., Paris, Armand Colin, 1985, 2 vol.

BRAYSHAW GILHESPY, F. *Derby Porcelain*, new ed. of the vol. published by MacGibbon & Kee in 1961, London, Spring Books, 1965.

BRILLAT-SAVARIN. *Physiologie du goût*, Paris, Flammarion, 1982 (Champs).

BROWN, Craig, ed. *The Illustrated History of Canada*, Toronto, Lester & Orpen Dennys Ltd., 1987.

BUGGEY, Susan.

"Period gardens in Canada: A researcher's resources," *Research Bulletin*, No. 87 (1978), Canadian Parks Service, Ottawa.

"18th Century Canadian Gardening: Good Gardens Full of Garden Stuff?," *Canadian Horticultural History*, Vol. 1, No. 2 (1986), p. 92-108, Royal Botanical Gardens, Hamilton, Ont.

CAMPBELL, Anita. "Le *creamware*", *Dossiers*, No. 57, Québec, ministère des Affaires culturelles, 1984.

CAMPBELL, J. Duncan. "Military Buttons," *Mackinac History*, Mackinac Island, Michigan, Mackinac Island State Park Commission, 1965, Leaflet No. 7.

CANADA (Government). Energy, Mines and Resources. *Home Energy Management: A Planned Approach to Saving Energy Dollars*, n. l., n. d.

(The) Canadian Antiquarian and Numismatic Journal, "Inventaire et état des lieux du fort Saint-Louis," Second Series, Vol. 1 (April 1890), p. 153-156.

CARDINAL, Pierre (AnthroSpec). "1re hôpital Général de MTL. 1692-1872. Rapport final concernant les fouilles archéologiques de 1979 & 1980. BiFj-4.," manuscript on file (1981), Direction générale du patrimoine, ministère des Affaires culturelles du Québec, Québec, vol. 1.

CAREY, Matthew, ed. "Of Ice and Icehouses," *The American Museum, or, Universal Magazine: Containing Essays on Agriculture — Commerce — Manufactures* [...], (Sept. 1792), Philadelphia.

(The) Castleford Pottery Pattern Book 1796, Reprint of the ed. published by D. Dunderdale in 1796, England, EP Publishing Limited, 1973.

CHAMPLAIN, Samuel de. *The Works of Samuel de Champlain*, ed. Biggar, Toronto, The Champlain Society, 1933, Vol. V.

CHARBONNEAU, A., Y. DESLOGES and M. LAFRANCE. *Québec, ville fortifiée du XVIIe au XIXe siècle*, Québec, Pélican and Parcs Canada, 1982.

CHARTRÉ, C., J. GUIMONT, Y. LAFRAMBOISE and G. PELLETIER (Ethnotech). *Évolution historique de la terrasse Dufferin et sa zone limitrophe de 1838 à nos jours*, Microfiche Reports Nos. 29-30 (1981), Canadian Parks Service, Ottawa.

CHÉNIER, Pierre and Michel LAFRENIERE. "Archéologie de sauvetage, site du château Saint-Louis," manuscript on file (fall 1975), Canadian Parks Service, Québec.

CLOUTIER, Johanne. "Chaînes de titres de deux maisons situées au sud-est de la rue des Carrières," manuscript on file (1981), Canadian Parks Service, Québec.

COBBET, William. *The American Gardener, or a Treatise on the Situation, Soil, Fencing and Laying-out of Gardens; on the Making and Managing of Hot-Beds and Green-Houses; and on the Propagation and Cultivation of the several sorts of Vegetables, Herbs, Fruits and Flowers*, Stereotype Edition, London, C. Clement, 1821.

COURCY, Simon.

"Le major Eliot: rapport préliminaire," manuscript on file (1981), Canadian Parks Service, Québec.

"La culture matérielle de l'îlot domestique à la terrasse Dufferin au XVIII[e] siècle, étude préliminaire," manuscript on file (1983), Canadian Parks Service, Québec.

COYSH, A. W. *Blue and White Transfer Ware* 1780-1840, 2nd ed. (revised) of the volume published in 1970, London and Vancouver, David & Charles, 1974.

CUMBAA, S. L. "An Analysis of Animal Bones From the 1696 Wreck of HMS Sapphire, Bay Bulls, Newfoundland," manuscript on file (1979), Zooarchaeological Identification Centre, National Museum of Natural Sciences, Ottawa.

DALHOUSIE, George Ramsay (9th Earl of). *The Dalhousie Journals*, ed. Marjory Whitelaw, Ottawa, Oberon Press, Vol. 2 (1981), Vol. 3 (1982).

D'ALLAIRE, Micheline. *L'hôpital-général de Québec 1692-1764*, Montréal, Fides, 1971 (Fleur de Lys Collection).

DAMBLON, F. "L'analyse des macrorestes végétaux et la reconstitution des environnements à l'époque quaternaire," *Lejeunia*, new series, No. 117 (December 1985), Liège.

D'AVILER, Augustin Charles. *Dictionnaire d'architecture civile et hydraulique, et des arts qui en dépendent: comme la Maçonnerie, la Charpenterie, la Menuiserie, la Serrurerie, le Jardinage, & la construction des Ponts & Chaussées, des Ecluses, & de tous les ouvrages hydrauliques*, a new corrected and considerably expanded edition, Paris, Charles-Antoine Jombert, 1755.

DÉCARIE-AUDET, L., N. GENET and L. VERMETTE. *Les objets familiers de nos ancêtres*, Montréal, Les Éditions de l'Homme, 1974.

DECHÊNE, Louise. *Habitants et marchands de Montréal au XVII[e] siècle*, Montréal, Plon, 1974 (Collection Civilisations et Mentalités).

DENIS and ROUARD. *Traité complet de l'horticulture pour les grands et les petits jardins: précédé de La botanique simplifiée*, Paris, Challamel, 1846.

DE VOE, Thomas F. *The Market Assistant*, new edition of the volume published in New York by Hurd and Houghton in 1867, Detroit, Gale Research Company, 1975.

DICKSON, Paul. *The Great American Ice Cream Book*, New York, Atheneum, 1972.

DIDEROT and D'ALEMBERT. *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers, par une société de gens de lettres*, reprint of the edition published in Paris, by Briasson, David L'Aîné, Le Breton, Durand, between 1751 and 1765, New York, Readex Microprint Corporation, 1969.

DROUIN, Pierre.

"Report on Archaeological Research at the Master's House of the Forges du Saint-Maurice," *Research Bulletin*, No. 144 (1980), Canadian Parks Service, Ottawa.

La Grande Maison des Forges du Saint-Maurice: rapport archéologique, 1977-1978, Microfiche Report No. 278 (1982), Canadian Parks Service, Ottawa.

DUFEBVRE, B. *Cinq femmes et nous*, Québec, Bélisle, 1950.

DUKE OF SAXE-WEIMAR EISENACH, Bernhard. *Travels Through North America, During the Years 1825 and 1826*, Philadelphia, Carey, Lea & Carey, 1828, 2 vol.

DUPUIS A. "Origine des pruniers européens du Canada," *Journal d'Agriculture et d'Horticulture*, No. 9 (1905-1906).

ÉLIE, Monique and Roxane RENAUD.

"Archaeological Research At Dufferin Terrace, Quebec City, 1985," *Research Bulletin*, No. 256 (1987), Canadian Parks Service, Ottawa.

"Le fort Saint-Louis de Québec et ses dépendances (1692-1854): recherche archéologique 1986," *Bulletin de recherches*, No. 267 (1988), Canadian Parks Service, Ottawa.

"Répertoire des vestiges archéologiques mis au jour dans la cour sud-est du château Saint-Louis (1985-1987)," manuscript on file (1988), to be published in the Microfiche Report Series, Canadian Parks Service, Ottawa.

ELLIS, Monica. *Ice and Icehouses Through the Ages: with a Gazetteer for Hampshire*, Southampton, Southampton University Industrial Archaeology Group, 1982.

Encyclopaedia: or, Dictionary of Arts, Sciences [...], Philadelphia, Thomas Dobson, 1798.

Encyclopédie du XIX[e] siècle: répertoire universel des sciences, des lettres et des arts, avec la biographie de tous les hommes célèbres, Paris, Au Bureau de l'Encyclopédie du XIX[e] siècle, 1836-1855.

FERNALD, M. L. *Gray's Manual of Botany*, 8th edition, New York, American Book Company, 1950

FITZPATRICK, John C., ed. *The Writings of George Washington from the Original Manuscript Sources 1745-1799*, Washington, U. S. Govt. Print. Off., 1931-1944.

FORTIN, Catherine.

"Les macrorestes végétaux des latrines de la cour sud-est du château Saint-Louis, Québec," manuscript on file (1987), to be published in the Manuscript Report Series, Canadian Parks Service, Ottawa.

"Les macrorestes végétaux du Bas-Jardin, château Saint-Louis, Québec," manuscript on file (1987), to be published in the Manuscript Report Series, Canadian Parks Service, Ottawa.

FOWLER, Thomas. *The Journal of a Tour Through British America to the Falls of Niagara [...]*, Aberdeen, Lewis Smith, 1832.

FOX, Louise. "Examen et recommandations pour la conservation des madriers et autres morceaux de bois de la glacière du château Saint-Louis, ville de Québec," trans. Sylvie Marcil, manuscript on file (July 1986), Conservation Division, Canadian Parks Service, Ottawa.

GAGNON, Ernest. *Le fort et le château Saint-Louis. (Québec) Étude archéologique et historique*, Montréal, Beauchemin, 1925.

GAGNON-PRATTE, France. *L'architecture et la nature à Québec au XIX^e siècle: Les villas*, Québec, ministère des Affaires culturelles, 1980.

GODDEN, Geoffrey A.

An Illustrated Encyclopaedia of British Pottery and Porcelain, New York, Bonanza Books, 1965.

Godden's Guide to Mason's China and the Ironstone Wares, new revised and expanded edition of the volume published by Barrie & Jenkins in 1971, Woodbridge (England), The Antique Collectors' Club, 1980.

GODFREY, W. Earl. *The Birds of Canada*, Ottawa, National Museum of Natural Sciences, National Museums of Canada, 1986.

GOODING, S. James. *An Introduction to British Artillery in North America*, Ottawa, The Runge Press Limited, 1972.

GUIMONT, Jacques. "La théorie des graphes, un instrument d'analyse archéologique," unpublished manuscript (1985), Québec.

GUIMONT, Jacques (Ethnotech). *Étude sur l'évolution historique du secteur du Château Saint-Louis et de sa zone limitrophe de 1760 à 1838*, Microfiche Report No. 45 (1983), Canadian Parks Service, Ottawa.

HALSTED, Byron D. *Barns, Sheds and Outbuildings*, reprint of the original edition published in 1881 by Orange Judd, New York, under the title: *Barn Plans and Outbuildings*, Brattleboro (Vt), The Stephen Greene Press, 1977.

HAMELIN, Jean and Yves ROBY. *Histoire économique du Québec 1851-1896*, Montréal, Fides, 1971.

HOOKER, Sir W. J. *Flora boreali-americana; or the botany of the northern parts of Britisth America...* London, H. G. Bohn, 1840, 2 volumes.

HURPHY, Isabelle and Frédéric NICOLAS. *Effets de serres, conception et construction des serres bioclimatiques*, Paris, Edisud/Pye-Edition, 1981.

HUXLEY, Anthony. *An Illustrated History of Gardening*, London, Paddington Benne Ltd., 1978.

JEFFERSON, Thomas. *Thomas Jefferson's Garden Book 1766-1824: With relevant extracts from his other writings*, annotated by Edwin Morris Betts, Philadelphia, The American Philosophical Society, 1944.

JONES, Olive R. *Les bouteilles à vin et à bière cylindriques anglaises 1735-1850*, Études en archéologie, architecture et histoire (1986), Canadian Parks Service, Ottawa.

JONES, Olive R. and E. Ann SMITH. *La verrerie utilisée par l'armée britannique de 1755 à 1820*, Études en archéologie, architecture et histoire (1985), Canadian Parks Service, Ottawa.

JONES, Joseph C., Jr. *America's Icemen: An Illustrative History of the United States Natural Ice Industry 1665-1925*, Humble (Texas), Jobeco Books, [1984].

Journal d'agriculture et transactions de la Société d'Agriculture du Bas-Canada, "Glacières," vol. 4, No. 2 (February 1851), Montréal.

KALM, Pehr. *Voyage de Pehr Kalm au Canada en 1749*, annotated translation of the travel journal by J. Rousseau and G. Béthune with the co-operation of Pierre Morisset, Montréal, Pierre Tisseyre, 1977.

KRAFFT, J. Ch. *Recueil d'architecture civile*, new edition, Paris, Bancé aîné, 1829.

LACELLE, Claudette. *Les domestiques en milieu urbain canadien au XIX^e siècle*, Études en archéologie, architecture et histoire (1987), Canadian Parks Service, Ottawa.

LAFRENIERE, Michel. "Terrasse Dufferin, corps de garde 38G1," résumés de lots, cahier No. 1, manuscript on file (1980), Canadian Parks Service, Québec.

LAHAISE, Robert. *Les édifices conventuels du vieux Montréal*, Montréal, Hurtubise, HMH, 1980 (Cahiers du Québec).

LALIBERTÉ, Monique.

Le corps de garde de la Caronade: étude de l'architecture et de la quincaillerie du bâtiment, Travail inédit No. 452 (1981), Canadian Parks Service, Ottawa.

Étude des artefacts provenant des latrines de la maison occupée par George Augustus Eliot, ca 1823-1831, Microfiche Report No. 80 (1983), Canadian Parks Service, Ottawa.

LAMBERT, John. *Travels Through Canada and the United States of North America in the Years 1806, 1807, & 1808*, 2nd corrected and improved edition, London, C. Cradock and W. Joy, 1813.

LAPOINTE, Camille. "La collection de terre cuite grossière des sites de potiers de Saint-Denis-sur-Richelieu," manuscript on file (March 1982), Direction générale du patrimoine, ministère des Affaires culturelles du Québec, Québec.

LAPOINTE, Camille (AnthroSpec). *Le verre des latrines de la maison Perthuis*, Dossiers, No. 52 (1981), ministère des Affaires culturelles du Québec, Québec (Les collections archéologiques de la place Royale).

LAURENT, Jeannine and Jacques ST-PIERRE. *Les forts et châteaux Saint-Louis, 1620-1760*, Microfiche Report No. 40 (1982), Canadian Parks Service, Ottawa.

LEBLOND. *A Treatise of Artillery*, republication of the translation published in London by E. Cave in 1746, Ottawa, Museum Restoration Service, 1970.

LEIM, A. H. and W. B. SCOTT. *Fishes of the Atlantic Coast of Canada*, Bulletin, No. 155 (1966), Fisheries Research Board of Canada, Ottawa.

LEMOINE, J. M.

L'album du touriste, 2nd edition, Québec, Augustin Côté et Cie, 1872.

Picturesque Quebec: A Sequel to Quebec Past and Present, Montréal, Dawson Brothers, 1882.

Monographies et Esquisses, Québec, J. G. Gingras and Cie, 1885.

LESSARD, Michel and Huguette MARQUIS. *Encyclopédie de la maison québécoise*, Montréal, Les Éditions de l'Homme, 1972.

LOUDON, John Claudius.

The Green-House Companion, London, Harding & Co., 1824.

An Encyclopaedia of Gardening, new enlarged and improved edition, with a foreword by J. C. L. (1834), London, Longman, Orme, Brown, Green, and Longmans, [1846].

MASTERS, Thomas. *The Ice Book: Being a Compendious History of Everything Connected With Ice [...]*, London, Simpkin, Marshall & Co., 1844.

McANDREWS, J. H., R. D. FECTEAU and J. KLINGBAUM. "Floral Analyses of Seeds and Soil Samples," A report on contract No. 82-86 to Parks Canada National Historic Parks and Sites (1982), Departement of Botany, Royal Ontario Museum, Toronto, manuscript on file, Canadian Parks Service, Québec.

McCULLOUGH, A. B. *La monnaie et le change au Canada des premiers temps jusqu'à 1900*, trans. of *Money and Exchange in Canada to 1900* (Toronto and Charlottetown, Dundurn Press, 1984), Études en archéologie, architecture et histoire (1987), Canadian Parks Service, Ottawa.

McKEARIN, Helen and Kenneth M. WILSON. *American Bottles & Flasks and Their Ancestry*, New York, Crown Publishers, 1978.

McNALLY, Paul. *Verrerie de table au Canada, 1700-1850*, Histoire et archéologie No. 60 (1982), Canadian Parks Service, Ottawa.

MILLER, George L. "Classification and Economic Scaling of 19th Century Ceramics," *Historical Archaeology*, Vol. 14, 1980, p. 1-40.

MILLER, Philip. *Dictionnaire des jardiniers*, translation of the 8th edition (1768) of *The Gardener's Dictionary*, Paris, Guillot, 1785.

MIVILLE-DESCHENES, François. *Les objets archéologiques du fort Chambly* (1760-1940), Microfiche Report No. 280 (1986), Canadian Parks Service, Ottawa.

MOORE, Thomas. *An Essay on the Most Eligible Construction of Ice-Houses*: Also, *A Description of the Newly Invented Machine Called the Refrigerator*, Baltimore, Bonsal & Niles, 1803.

MOSS, William.

"Appareils et techniques de flottation en archéologie," manuscript on file (1981), Canadian Parks Service, Québec.

Recherche archéologique à la terrasse Dufferin de Québec, Microfiche Report No. 148 (1985), Canadian Parks Service, Ottawa.

MOSS, William *et al.* (Projet ATD). "Archéologie: Terrasse Dufferin. Rapport de recherche et propositions de mise en valeur pour la terrasse Dufferin, un site archéologique à Québec," manuscript on file (1980), Canadian Parks Service, Québec.

MOSS, William and Pierre CARDINAL. *Résultats de la recherche archéologique sur la courtine et le flanc nord à la terrasse Dufferin de Québec, 1981*, Microfiche Report No. 65 (1982), Canadian Parks Service, Ottawa.

MOUSSETTE, Marcel. *Analyse du matériel céramique du site acadien de Beaubassin (Opération 7B1 à 7B8)*, Travail inédit No. 17 (1970), Canadian Parks Service, Ottawa.

NEUMANN, Louis. *Art de construire et de gouverner les serres*, 2nd revised and enlarged edition of various article and two engraved plates, Paris, Audot, 1846.

NOËL HUME, Audrey.

Archaeology and the Colonial Gardener, Williamsburg (Va), The Colonial Williamsburg Foundation, 1974 (Colonial Williamsburg Archaeological Series No. 7).

Food, Williamsburg (Va), The Colonial Williamsburg Foundation, 1978 (Colonial Williamsburg Archaeological Series No. 9).

NICOL, Heather N.

"Bones From the Perthuis House Latrine at Place Royale, Québec (1682-1760)," Manuscript on file (1982), ZIC, National Museum of Natural Sciences, Ottawa.

The Domestic Economy of Two Québec City Houses (1740-1830), Microfiche Report No. 53 (1982), Canadian Parks Service, Ottawa.

O'NEILL, Anne. "Discipline and Beauty: The Orderly Gardens of 18th Century Louisbourg," *Canadian Collector*, Vol. 20, No. 2 (March 1985), Toronto, p. 42-44.

(The) Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge, London, Charles Knight, 1833-1843, 27 vol.

PERTHUIS, M. de. *Traité d'architecture rurale*, Paris, Deterville, 1810.

PESSEY, Christian. *Serres, Abris, Jardins d'hiver*, Paris, Bordas, 1984.

PHILLIPS, D. W. *Canadian Weather Trivia Calendar — 1988*, (1987) Environment Canada, Ottawa.

PIÉDALUE, Gisèle. *Résultats des fouilles d'urgence sous la terrasse Dufferin à Québec, 1980*, Travail inédit No. 451 (1981), Canadian Parks Service, Ottawa.

PLESSIS, l'abbé Joseph-Octave. "Les dénombrements de Québec faits en 1792, 1795, 1798 et 1805," *RAPQ pour 1948-1949*, Québec, Rédempti Paradis, [1949].

POITEAU A., *et al. Le bon jardinier ou l'Almanach pour l'année 1848*, 49th ed., Paris, Dusacq, 1848.

PRICE, Karen. *Glimpses of Soldiering at Coteau-du-Lac, Québec, 1780-1856*, Histoire et Archéologie No. 15 (1977), Canadian Parks Service, Ottawa.

PROVANCHER, L. *Flore canadienne*, Québec, J. Darveau, 1862.

PROVENCHER, J. *C'était l'été : La vie rurale traditionnelle dans la vallée du Saint-Laurent*, Montréal, Boréal Express, 1982.

PROVOST, Honorius. *Notre-Dame-de-la-Garde de Québec 1877-1977*, Québec, La Société historique de Québec, 1977, Cahiers d'histoire, No. 30.

QUATREMERE DE QUINCY, M. *Dictionnaire historique d'architecture*, Paris, Librairie d'Adrien Le Clerc et Cie, 1832, vol. 2.

QUÉBEC (government). Ministère des Affaires culturelles.

Fonds Morisset, M 182/24 (*Journal de Québec*, 16 May 1854).

Fonds Morisset, M 186/9 (P. G. Roy, *Bulletin de recherches historiques*, vol. V (July 1899); *Gazette* (Québec), 15 November 1827).

REITZ, E. J. and M. SCARRY, "Reconstructing Historic Subsistence with an Example from Sixteenth-Century Spanish Florida," ed. D. J. Seifert, Society for Historical Archaeology, Special Publication Series, No. 3 (1985).

RENAUD, Roxane.

Recherches archéologiques à l'écurie du major Eliott, située sous la terrasse Dufferin à Québec, 1980, Microfiche Report No. 4 (1981), Canadian Parks Service, Ottawa.

Résultats de la recherche archéologique à l'îlot domestique de la terrasse Dufferin, Québec, 1981, Microfiche Report No. 81 (1983), Canadian Parks Service, Ottawa.

"Surveillance archéologique sous la terrasse Dufferin à Québec, hiver 1983-1984," *Research Bulletin*, No. 230 (1984), Canadian Parks Service, Ottawa.

RENSONNET, Jean-Louis. "Ochain et Viercet: anciennes glacières rurales wallonnes: Qu'est-ce qu'une glacière?," *Le Jour* (Belgique), 28 April 1986.

ROBERT, Paul. Le Petit Robert 1: *Dictionnaire alphabétique et analogique de la langue française*, Montréal, Les Dictionnaires Robert-Canada S.C.C., 1987.

ROCHE, Daniel. "Le ventre des Parisiens au XVIII[e] siècle," *La cuisine et la table, 5000 ans de gastronomie*, presented by Jean Ferniot and Jacques Le Goff, [Paris], L'histoire/Seuil, [1986], p. 121-123.

ROUSSEAU, C. "Histoire, habitat et distribution de 220 plantes introduites au Québec," *Naturaliste Canadien*, vol. 95, No. 1 (1968), p. 49-171, PUL, Québec.

ROUSSEAU, François. *L'oeuvre de chère en Nouvelle-France: Le régime des malades à l'Hôtel-Dieu de Québec*, Québec, PUL, 1983, Les cahiers d'histoire de l'Université Laval, No. 29.

ROUSSEAU, Jacques. "Quelques jalons de l'histoire et de la géographie gastronomique du Québec," *Cahier des dix*, No. 32, Montréal, Édition des dix, 1967.

SAMSON, Roch. "Fishermen, Fishing Companies and Society on the Forillon Peninsula in the 19th century," *Research Bulletin*, No. 108 (1979), Canadian Parks Service, Ottawa.

SAUNDERS, R. M. "The First Introduction of European Plants and Animals Into Canada," *The Canadian Historical Review*, Vol. 16, 4 (1935).

SAVAGE, George and Harold NEWMANN. *An Illustrated Dictionary of Ceramics*, New York, Van Nostrand Reinhold, 1976.

SCHLESINGER, Isidor. *Der Eiskellerbau in Massiv — und holz — Construction*, Berlin, Ernst & Korn, 1864.

SCOGGAN, H. J. *The Flora of Canada*, National Museum of Natural Sciences Publications in Botany, No. 7 (4) (1979), National Museums of Canada, Ottawa.

SÉGUIN, Robert-Lionel. *La civilisation traditionnelle de l' "habitant" aux XVII[e] et XVIII[e] siècles*, Montréal, Fides, 1973.

SHEPHARD, Steven Judd. "Status Variation in Antebellum Alexandria: An Archaeological Study of Ceramic Tableware," Suzanne M. Spencer-Wood, ed., *Consumer Choice in Historical Archaeology*, New York and London, Plenum Press, 1987, p. 163-198.

SHER, J. A. "Un algorithme de classification typologique," J. C. Gardin, comp., *Archéologie et calculateurs*, Paris, CNRS, 1970, p. 193-203.

SIMCOE, Elizabeth. *Mrs. Simcoe's Diary*, ed. Mary Quayle Innis, Toronto, Macmillan of Canada, 1965.

STEWART, John. "L'art des jardins, trois siècles d'une tradition qui nous a légué un héritage inestimable," *Continuité*, No. 36 (summer 1987), Québec.

STEWART, John and Susan BUGGEY. "The Case for Commemoration of Historic Landscape," *Bulletin of the Association for Preservation Technology* (APT), Vol. VII, No. 2 (1975).

SULTE, Benjamin. "Les glaces," *La kermesse*, No. 1 (23 September 1892), p. 11-12, Québec.

SUSSMAN, Lynne.

"Comparing Ceramic Assemblages in Terms of Expenditure: A case Study from Lower Fort Garry," *Material History Bulletin*, No. 16 (winter 1982), National Museum of Man, Ottawa, p. 41-46.

"Flower Pots and Jardinieres in 18th and 19th Century Settings," unpublished picture file (1985), Canadian Parks Service, Ottawa.

THIBAULT, H. Paul. "La glacière de l'îlot 17," file prepared under the direction of Pierre Bureau (1968), Canadian Parks Service, Louisbourg.

TOUSSAINT-SAMAT, Maguelonne. *Histoire naturelle et morale de la nourriture*, Paris, Bordas, 1987 (Cultures).

TRUDEL, Marcel. *Initiation à la Nouvelle-France: histoire et institutions*, Montréal, Holt, Rinehart and Winston, 1968.

TURNER, N. J. and A. F. SZCZAWINSKI. *Fruits et noix sauvages du Canada*, Ottawa, National Museums of Canada, National Museum of Natural Sciences, 1979 (Collection Plantes sauvages comestibles du Canada, No. 3).

URE, Andrew. *A Dictionary of Arts, Manufactures and Mines Containing a Clear Exposition of their Principles and Practice*, New York, D. Appleton Company, MDCCCXLV [1845].

VAN ZEIST, V. and W. A. CASPARIE, ed. *Plants and Ancient Man*, Rotterdam – Boston, Balkema, 1984.

VAUGEOIS, Denis and Jacques LACOURSIERE. *Canada–Québec: Synthèse historique*, Montréal, Renouveau Pédagogique, 1973.

VON BAEYER, Edwinna. *L'histoire du jardinage au Canada: bibliographie sélective (revised and enlarged edition)*, Ottawa, Canadian Parks Service, 1987.

WYLER, Seymour B. *The Book of Old Silver*, 32th printing of the original edition published in 1937, New York, Crown Publishers, 1976.

YASUI, Catherine. "The Faunal Analysis of Two Structures From the Dépendances du Château Saint-Louis, Québec City, Québec (1771-1854)," manuscript on file (ZIC, National Museum of Natural Sciences, Ottawa, 1987), to be published in the Microfiche Report Series, Canadian Parks Service, Ottawa.

YASUI, Catherine and Ariane BURKE. "An Analysis of Faunal Remains From the Château Saint-Louis Courtyard Privy Québec City, Québec (1815-1854)," manuscript on file (ZIC, National Museum of Natural Sciences, Ottawa, 1987), to be published in the Microfiche Report Series, Canadian Parks Service, Ottawa.

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